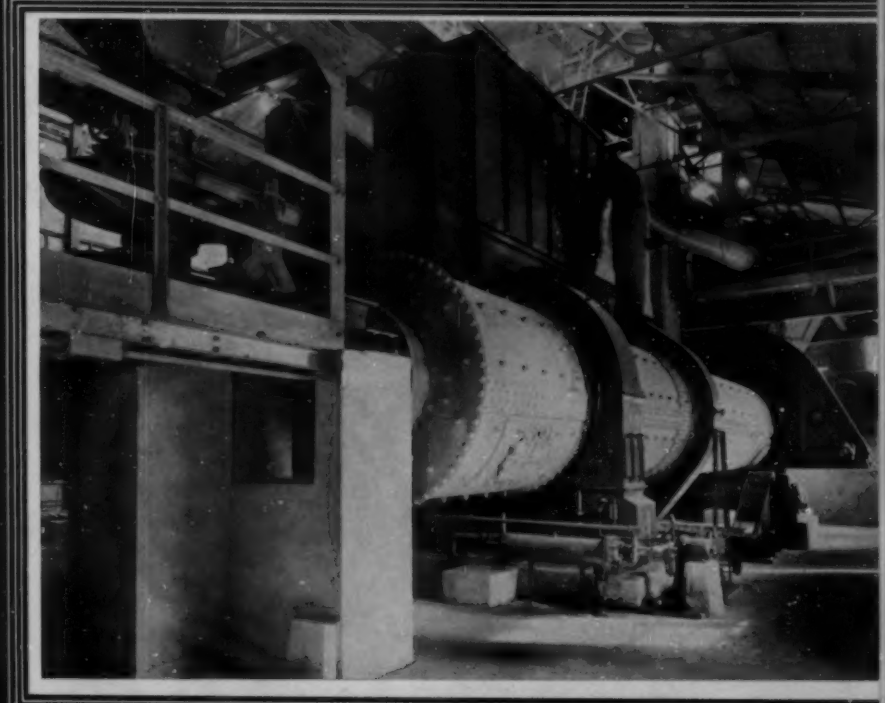
Rock Products

THE INDUSTRY'S RECOGNIZED AUTHORITY

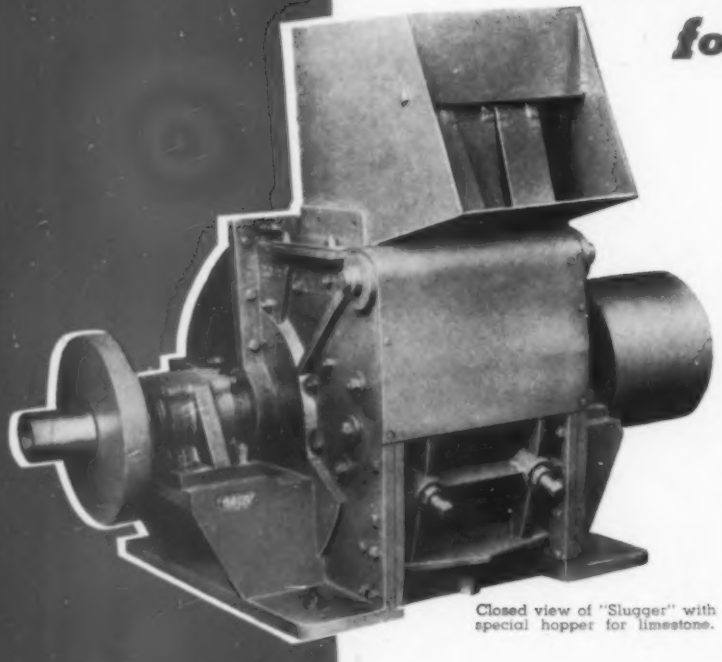
NOVEMBER, 1940



THE WILLIAMS "SLUGGER"

Crusher and Pulverizer

for AGRICULTURAL LIMESTONE



Closed view of "Slugger" with special hopper for limestone.

You can now crush large pieces of stone weighing from 75 to 100 pounds to agricultural limestone in One Operation with the Williams "Slugger". This not only eliminates sledging, but also does away with the unnecessary expense of a primary crusher.

The "Slugger" represents the most advanced type of crushing equipment on the market today and with seven sizes to choose from producing from 4 to 30 tons per hour, every producer whether large or small can now afford to install a Williams.

Also Crushes "One Man" Size Stone to 1¼" or ¾" in One Operation

By also reducing large rock to 1¼" or ¾" in one operation, the "Slugger" has enabled operators to produce these sizes at a low cost per ton and with small investment.

Open view of "Slugger" showing heavy duty hammers, liners and discs.

SEVEN SIZES

30 TO 150 HORSEPOWER

The Williams Patent Crusher & Pulverizer Co.
800 ST. LOUIS AVE. ST. LOUIS, MO.

SALES AGENCIES IN ALL PRINCIPAL CITIES INCLUDING

Chicago	NEW YORK	Oakland, Calif.
37 W. Van Buren St.	15 Park Row	1629 Telegraph Ave.

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Williams

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● For smooth, dependable, low-cost conveying and power transmitting service—use Link-Belt chains. We make all types of malleable iron, Promal, steel, stainless steel, bronze and other alloy chains and are free to recommend the best one for the purpose . . . including sprockets, shafting, bearings, collars, clutches, take-ups, couplings; in fact, everything to make your installation give trouble-free, long-life service.

Today—throughout the world—Link-Belt chains are accepted as the recognized standard. They are backed by 65 years of chain making experience.

Large stocks are carried at Link-Belt plants and warehouses and by authorized distributors.

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The Leading Manufacturer of Equipment for Handling Materials and Transmitting Power

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LINK-BELT CHAINS

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OF MALLEABLE IRON, PROMAL, BRONZE, STEEL, ALLOYS

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NOV 12 1940

NEXT MONTH'S ISSUE

TWO feature articles of extraordinary interest to our readers will appear next month. One article will describe the evolution of operating methods and practices of a large sand and gravel company in the Middle West. The article will also reveal the financial requirements to keep pace with operating practice through the years, which have been responsible for keeping this concern in the front ranks of the industry for nearly 50 years.

The story about this company is particularly appropriate for publication in the December issue of ROCK PRODUCTS as it will tie in with the early history of the National Sand and Gravel Association, which will celebrate its Silver Anniversary at the coming Cincinnati convention. ROCK PRODUCTS joins in this celebration with more than passing interest as it was the publisher and editor of ROCK PRODUCTS who launched the Association by inviting the sand and gravel operators of that early day to Chicago where the association was organized.

THE world's most interesting portland cement plant—its layout, equipment, methods of dust collection, and the unusual flexibility of the plant for the production of different types of cement and other products will make a story no reader will want to miss.

Making Stone Sand

Most stone sand has been produced as a by-product of other operations. The December issue will describe a plant for which crushing and screening equipment was carefully selected for the purpose of producing stone sand as a manufactured product, to have a definite quality standard to meet the most rigid specifications.

Concrete Products

While much is yet to be learned about efficient methods and equipment for the production of concrete products, the foremost problem before the industry is "How can I get my share of the building construction dollar?" The December issue will contain an article with many answers to this question in the form of a story about the up-to-the-minute merchandising practices of a well-known concrete products manufacturer.

Concrete silo manufacturers have found it necessary to expand their operations into new territory to supply the increasing demand. The concrete stave silo is coming into more general use for industrial storage purposes.

Ready Mixed Concrete

Another article will deal with a coöperative plan for the more efficient use of ready-mixed concrete truck units. An association of producers has been formed through which one producer having an unusually big contract may rent the surplus equipment of another operator at standard rates. The association also discusses promotional and advertising material which will build up the use of ready-mixed concrete to the benefit of all members.

ROCK PRODUCTS

RECOGNIZED THE WORLD OVER AS THE LEADER IN ITS FIELD

With which has been consolidated the journals *Cement and Engineering News* (founded 1896) and *Concrete Products* (established 1918)

VOL. 43, No. 11

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ROCK PRODUCTS Bears the Twin Hall-Marks of Known Value.

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Authentic facts relating to editorial scope and readership analysis. ABP

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Do you know that an old pump, seemingly faithful, can actually be in conspiracy to keep your power bills high?
If that pump is ten or more years old, regardless of condition, it is almost a certainty that it is costing you at least 10% more to operate than it should.
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GEAR TEETH and wire rope perform quietly, economically when lubricated with a tough, wear-defying film of *Texaco Crater*. All trucks are fueled and lubricated exclusively with Texaco.

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TEXACO MARFAK in the bearings of all belt conveyors keeps down wear, sealing out dust, dirt and rain water.

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Trained lubrication engineers will gladly cooperate in making savings with Texaco Products in your equipment. Phone the nearest of more than 2300 Texaco warehousing points in the 48 States, or write:

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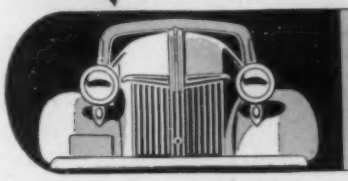

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The TIMKEN "H" Series Bit. A general purpose bit for contracting, mining, and quarrying to be used with light and medium weight drills. Comes in either side or center hole in sizes from 1¾" to 2½" gauge inclusive.

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The TIMKEN "R" Series Bit. Often referred to as the "rose" bit, the "R" series is used in soft formations like limestone and sandstone. It comes in either side or center hole in gauges 1¾" to 2½" inclusive.

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If your trade demands, or your process requires, large tonnages of material 5/16" or smaller, unusually cubical in character, with a minimum of slabs and not too much waste fines, this Multi-Stage Fine Reduction Crusher is preeminently your "buy".

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Our Bulletin No. 113, available upon request, describes in full. Or, we'll be glad to have our representative call, if you'll say when. Write us today!

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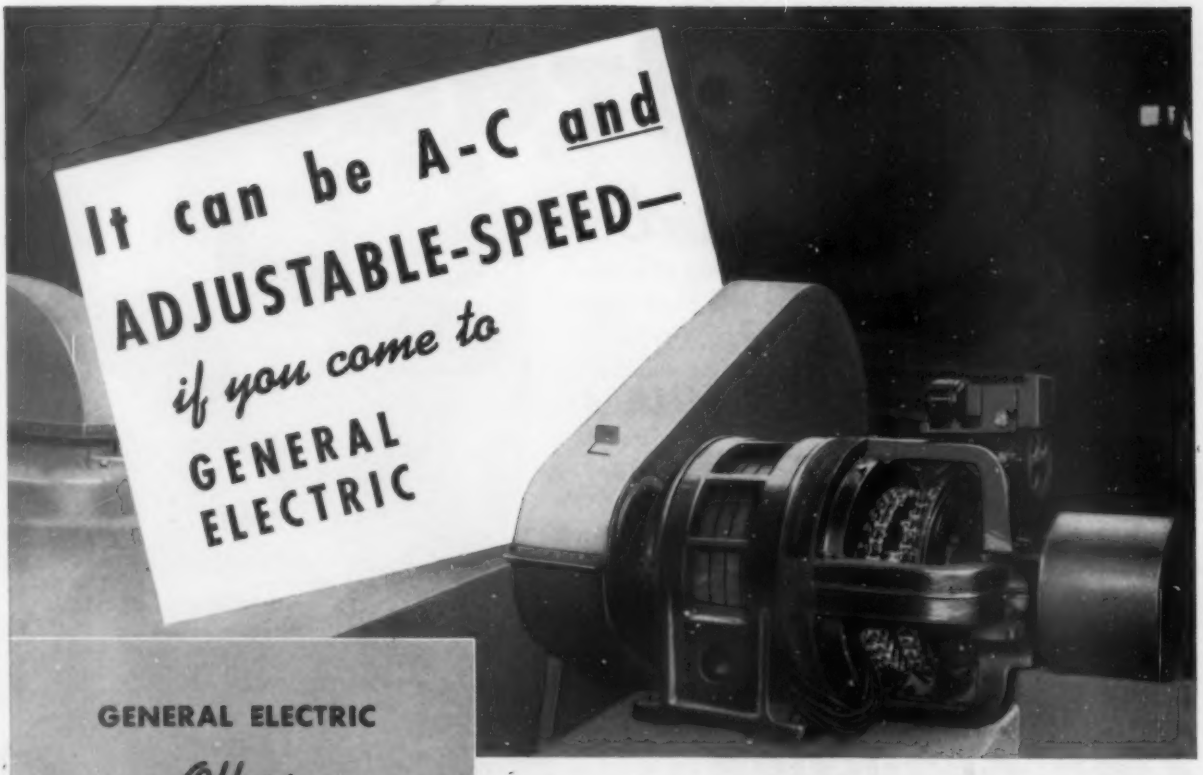

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652-4

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TELSMITH
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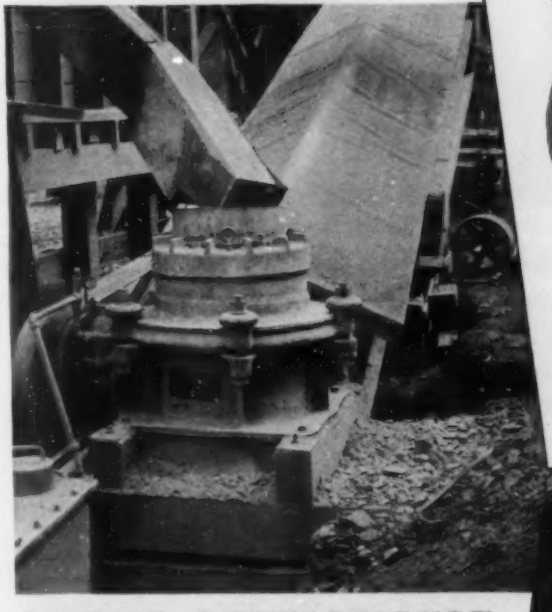
CRUSHER



MURPHY CONSTRUCTION COMPANY, INC.
MONONGAHELA BLDG.
MORGANTOWN, WEST VA.

August 1st, 1940

Smith Engineering Works
Milwaukee, Wisconsin

Attention: Mr. D. D. Barnes, Sales Manager

Gentlemen:

We are in receipt of your letter of July 30th in which you request some information relative to the operation of our recently purchased Telsmith Intercone Crusher.

We are very pleased to furnish you with this information together with some additional comment. This crusher was put in service by us six or eight weeks ago and has been in continual operation since that time. We are very much pleased with its performance, in fact its efficiency is somewhat beyond our expectation. We believe that this crusher very definitely fills a much needed demand for a crusher of this type in this particular field. Its capacity for the reduction of two inch stone to a one-half minus size is unsurpassed in our experience. Another very desirable feature of the crusher is that in a reduction of this range the percentage of fines below No. 50 mesh is negligible, which of course effects considerable saving in waste material to the producer.

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Yours very truly,
MURPHY CONSTRUCTION COMPANY, INC.
By: Thomas Murphy
President.

TM:V
Enc.

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THE SMITH ENGVNEERING WORKS=

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Write for Bulletin IC-11

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IC-3

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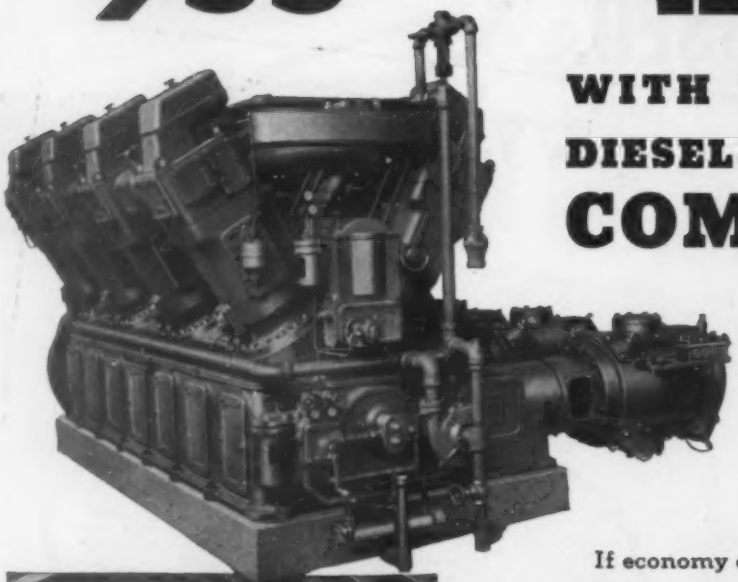
933 CU. FT. OF AIR FOR 1¢*

WITH THE XVO DIESEL-ENGINE-DRIVEN COMPRESSOR



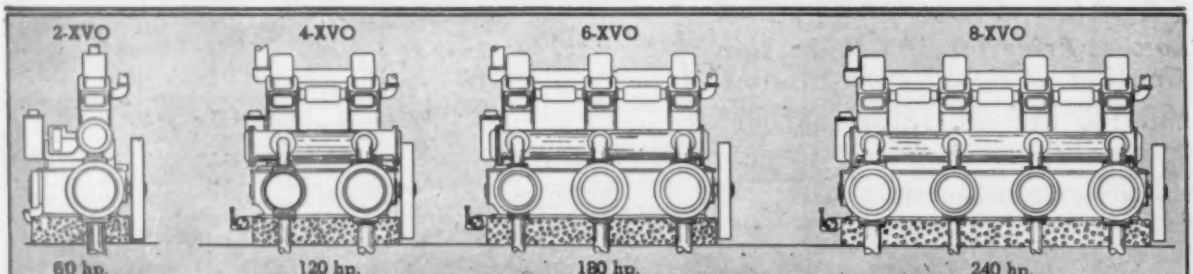
Two-stage 4-XVO furnishing air for tunnel work on the Pennsylvania Turnpike.

* 1¢ worth of fuel oil (6¢ per gallon) compresses 933 cu. ft. of air to 100 lbs. pressure in the XVO.

If economy counts first in your compressor plant, *do not fail to consider the XVO.* It has a higher operating economy and a much lower upkeep cost than any other Diesel-engine-driven compressor ever produced by Ingersoll-Rand. Moreover, the XVO is built for twenty-four-hour, continuous service.

If your compressor requirements fall within the power range of the XVO, there is a combination of cylinders to give you a compact, efficient unit for any pressure or vacuum. Standard units for 100 lb. pressure are available in capacities of 312, 625, 935, 1250 cubic feet per minute actually delivered.

Call or write the nearest Ingersoll-Rand branch for more information on the savings that a Type XVO compressor can make for you.



The diagrams show standard cylinder and intercooler arrangements for two-stage 100-lb. compression with each size unit.

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IN 2, 3 AND 4 CU. YD. SIZES FOR UTILITY SERVICE

With One-Shot Loading, Dual-Mix Drum and Flip-of-Finger Vacuum Controlled Discharge Door, these units are fastest to load, mix and discharge of any high discharge type on market. More compact for economical mounting, maximum truck payload (2 Yd. can mount on short wheelbase Ford). Meet difficult placing problems (even 2 Yd. can dump into hoppers, big buckets or over dirt piles); fit into needs of small towns as well as fleets of Standard Jaeger units.

In *Both* Types, You Get These Features That *Jaeger Alone Can Offer:*

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STANDARD HEAVY DUTY TYPE

TRUCK MIXER SIZES UP TO 8 CU. YDS. FOR STEADY HIGH PRODUCTION—ANY DEMAND

WORLD'S BIGGEST TRUCK MIXER ORDER: N. Y. CITY PLANTS BOUGHT 145 OF THESE 5½ YD. UNITS

More ready-mixed concrete is being produced with Jaeger Standard Truck Mixers and Agitators than by any other method. From 2 to 8 Yd. sizes they are fastest to discharge, low to load, most economical to maintain. Overwhelming choice of operators who do steady, big volume business.

Send for Catalog, Prices, Terms!

THE JAEGER MACHINE CO.

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7000 Tons of Limestone

P-U-S-H-E-D OUT *and*

HERE's one for the textbooks—a perfect example of controlled blasting at the Luckey, Ohio, quarry of the National Gypsum Company.

Just look at that heaving action in the center photograph! Tons of limestone pushed out by the "controlled force" of Atlas explosives fired with Atlas electric blasting caps —without a sign of escaping gases!

The Atlas Representative can help you get the maximum effect, with minimum waste, from Atlas explosives on your job. Talk it over with him the next time he drops around.

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A Better Rock Shovel

TURNS LOSS TO INCREASES CAPACITY 171%...

"WORTH THE ENTIRE COST OF the crusher!" That's what Gen. Mgr. L. L. McLean of Gold Producers, Inc., thinks of the ease with which his No. 322 Type "R" Crusher can be put back in service after a power interruption. And the rugged simplicity of both the Allis-Chalmers Type "R" and Newhouse Crushers makes them ideal for isolated locations. Note the size of feed taken by the 7" Newhouse (inset).

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PROFIT... WITH ALLIS-CHALMERS CRUSHERS!

THE TRUE STORY OF A GOLD MINE ON "THE RIVER OF NO RETURNS"

On the edge of the "Primitive Area" on the banks of Idaho's "River of No Returns" is the mining property of Gold Producers, Inc. Site of the old Kentuck mine that produced millions in gold in the last century, Gold Producers several years ago was faced with the problem of lowering their costs in order to make a profit on the low grade marginal ore they had to work.

Until two years ago they had a 20"x 10" single toggle jaw crusher, which had to run two shifts to turn out the required 70 tons per day of ball mill feed. By installing a 7" Allis-Chalmers Newhouse Crusher they were able to produce the 70 tons of ¼" ball mill feed in less than one shift. In other words, they doubled their capacity . . . saved over one man-day every 24 hours!

Came to Allis-Chalmers!

A short time later when the demand increased, they naturally came to Allis-Chalmers . . . opened up the Newhouse to produce 1½" stone . . . installed one of the No. 322 Allis-Chalmers Type "R" Crushers as the secondary breaker . . . stepped up capacity another 25 tons per eight hour shift.

And here's what L. L. McLean, General Manager of Gold Producers, Inc., has to say about his Allis-Chalmers Crushers:

"We feel that in a remote location like ours these reliable machines insure continuity of operation . . . have turned a certain loss (had we been forced to continue operating the original jaw crusher) into a profit.

Protected Against Power Failures!

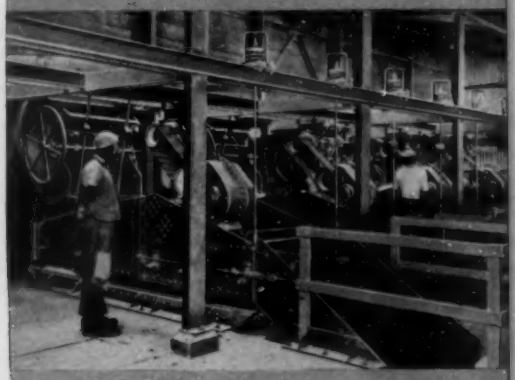
"One of the things that most impressed us was the protection the Type "R" Crusher gives us when the power fails while the machine is under load. Instead of the four or five hours required to clean out the other crushers, all the operator has to do is turn a petcock to drop the head . . . and when power is resumed, start up the crusher and pump back the head—a matter of only a few minutes' time."

The story of Gold Producers, Inc., is only one of hundreds about operators that have put Allis-Chalmers cooperative engineering to work for them. No matter what your problem is, the combined facilities of the world's largest manufacturer of rock and ore reduction machinery can help you get the most economical solution.

Let a specialist in your particular field work with your own engineers to give you the *right* machine for the job you want done. For complete information call the district office near you. Or write direct to Allis-Chalmers, Milwaukee . . . *today!*

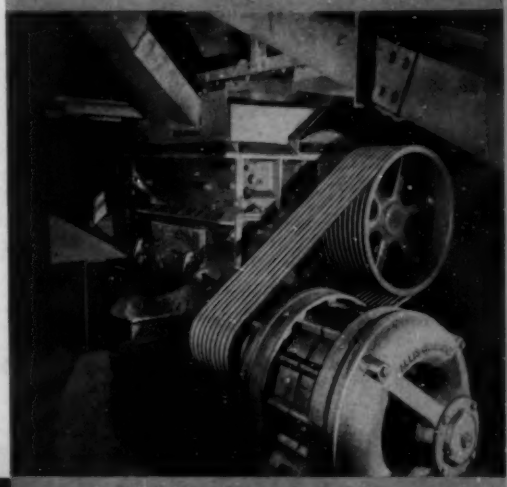
A-1316

News of other Allis-Chalmers Products that cut your costs!



IN A SOUTH AFRICAN CRUSHING plant, these four 4 ft. by 12 ft. single deck Allis-Chalmers Low-Head Screens deliver better separations . . . with minimum maintenance costs.

WHERE CONTINUOUS SERVICE under tough operating conditions is required, Allis-Chalmers SSUnit Pumps deliver more water at lower cost in crushing plants all over the world.

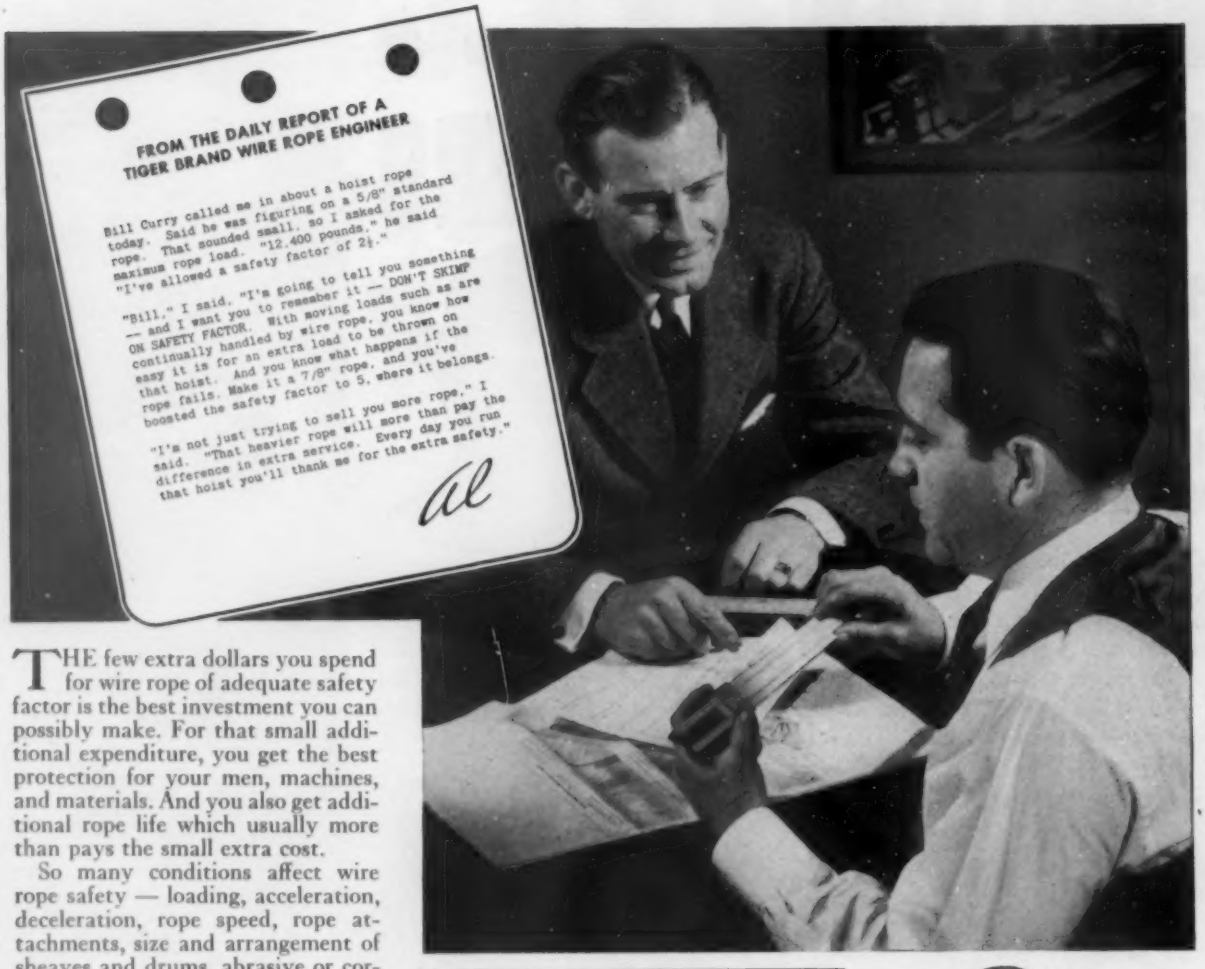


IN CRUSHING PLANTS ALL OVER the world, combinations of positive, slipless Texrope Drives and Lo-Maintenance Motors, like the ones shown here, give low-cost, long-life service.

ALLIS-CHALMERS

MILWAUKEE · WISCONSIN

DON'T SKIMP ON SAFETY FACTOR


FROM THE DAILY REPORT OF A
TIGER BRAND WIRE ROPE ENGINEER
Bill Curry called me in about a hoist rope today. Said he was figuring on a 5/8" standard rope. That sounded small, so I asked for the maximum rope load. "12,400 pounds," he said "I've allowed a safety factor of 2½."
"Bill," I said, "I'm going to tell you something — and I want you to remember it — DON'T SKIMP ON SAFETY FACTOR. With moving loads such as are continually handled by wire rope, you know how easy it is for an extra load to be thrown on that hoist. And you know what happens if the rope fails. Make it a 7/8" rope, and you've boosted the safety factor to 5, where it belongs.
"I'm not just trying to sell you more rope," I said. "That heavier rope will more than pay the difference in extra service. Every day you run that hoist you'll thank me for the extra safety."
al

THE few extra dollars you spend for wire rope of adequate safety factor is the best investment you can possibly make. For that small additional expenditure, you get the best protection for your men, machines, and materials. And you also get additional rope life which usually more than pays the small extra cost.

So many conditions affect wire rope safety — loading, acceleration, deceleration, rope speed, rope attachments, size and arrangement of sheaves and drums, abrasive or corrosive conditions. Usually one or more of these factors are variable and accordingly, difficult to predict accurately. Therefore, in order to avoid overstressing and subsequent disastrous results, allow adequate safety factors in figuring your wire rope requirements.

In case of doubt about safety factor, ask any American Tiger Brand Wire Rope Engineer. These men bring you, without obligation, all the practical experience gained from thousands of successful installations.

RECOMMENDED MINIMUM SAFETY FACTORS

Track cables	3.2
Guys	3.5
Mine Shafts	
depths to 500 ft.	8.0
depths 500 - 1000 ft.	7.0
depths 1000 - 2000 ft.	6.0
depths 2000 - 3000 ft.	5.0
depths over 3000 ft.	4.0
Miscellaneous hoisting	5.0
Haulage ropes	6.0
Overhead & Gantry cranes	6.0
Jib & Pillar cranes	6.0
Derricks	6.0
Small Electric & Air Hoists	7.0
Hot ladle cranes	8.0
Slings	8.0

USS

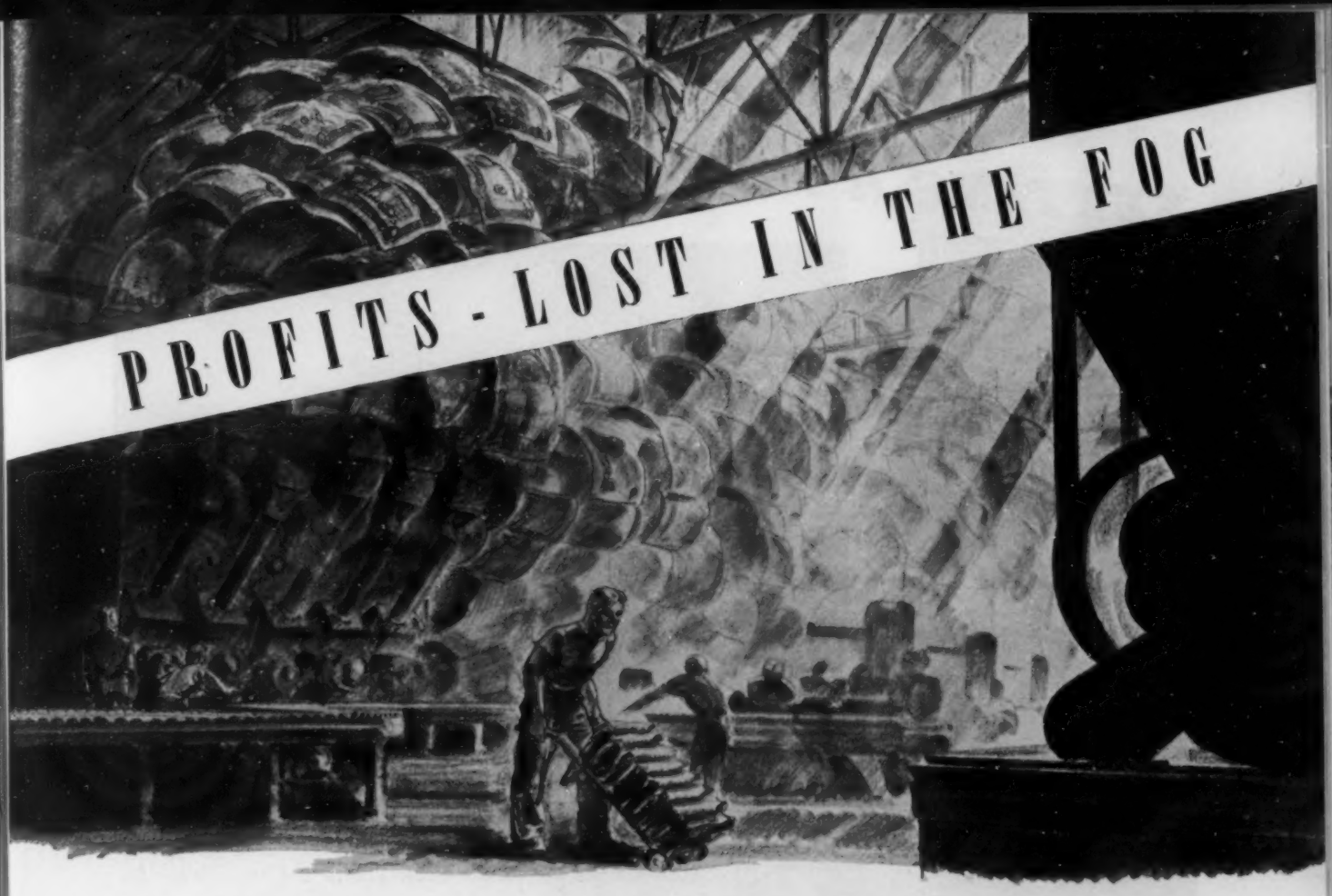
EXCELLAY *Preformed* **WIRE ROPE**

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York

COLUMBIA STEEL COMPANY
San Francisco

United States Steel Export Company, New York

UNITED STATES STEEL



• Millions of dollars worth of recoverable values are being blown into the air or swooshed into sewers by American industries every year. The modern trend is against this needless waste.

• Alert plant managers turn to the Cottrell Process of Electrical Precipitation for the remedy because Cottrells have shown their amazing versatility in salvaging wastes in diverse industries.

• Who would have thought that Cottrells could recover salt cake from paper mill black liquor that formerly was wasted and polluted streams and sewers? Cottrells now save these values and at the same time abate a nuisance.

• Time was when blast furnace gas was burned uselessly at the top of the stack. Now Cottrells take out the dust and deliver clean fuel to furnaces, boilers and engines.

• Turn to tar fog in manufactured gas. Cottrells get the tar, oil and water at the same time, reduce the draft loss to almost nothing, save the by-products and cut the overall cost of purification.

• Sulphuric acid mist used to waste itself in the air at smelters and oil refineries. Now Cottrells collect the acid and make it usable again—with no complaints from injured neighbors.

• The history of the Cottrell Process is filled with almost unbelievable performances in every industry that has problems in dust, fog, fume or mist control —for the recovery of values or the abatement of a nuisance or both.

• Take a look at your business. Are you wasting recoverable values? Is your plant clean—inside and outside? If there is any doubt about your conditions you are welcome to the full use of our comprehensive experience and exhaustive researches in all problems of dust, fog, fume and mist control.

CLEAN STACKS AT THIS COTTRELL-PROTECTED CEMENT PLANT

Cottrell Electrical Precipitators are collecting from 20 to 30 percent of total materials input as dust that would otherwise escape as a nuisance and a financial loss. Most of this material is returned to the kilns. Cottrells create good will and good profits at cement plants.

WESTERN PRECIPITATION CORPORATION
1016 W. NINTH ST., LOS ANGELES, CALIF. • CHRYSLER BLDG., NEW YORK
140 SOUTH DEARBORN STREET, CHICAGO • HOBART BLDG., SAN FRANCISCO

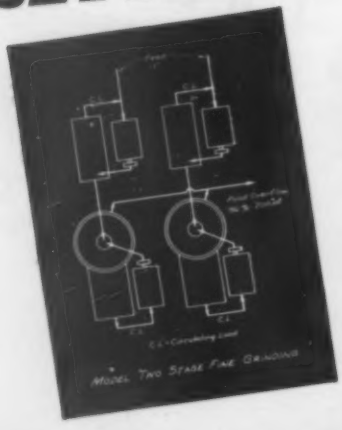
PRECIPITATION COMPANY OF CANADA, LTD.
DOMINION SQUARE BUILDING, MONTREAL, P. Q.

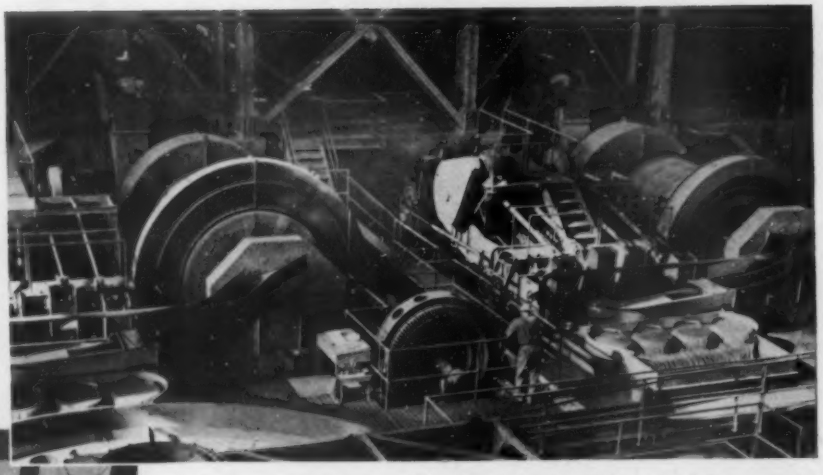
Write now for this new Booklet that briefs the amazing performance of Cottrells in recovering profits from the fog.

COTTRELL
ELECTRICAL PRECIPITATORS

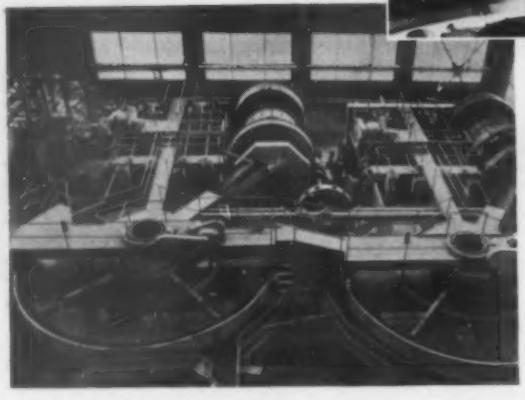
MULTICLONE
MECHANICAL COLLECTORS

SETTING A NEW RECORD in





Step 1—Primary ball mills in closed circuit with Dorr Classifiers



Step 2—Secondary ball mills in closed circuit with Dorr Bowl Classifiers

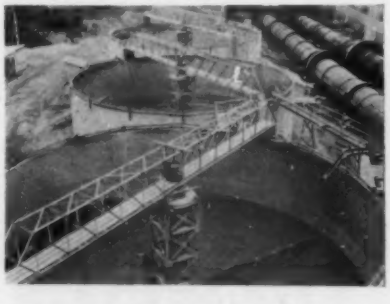
CEMENT RAW GRIND COSTS

★ The Dorr C.C.G. (Closed Circuit Grinding) System at the Permanente Corp.'s 12,000 bbl. plant at Permanente, Cal., is grinding 1" rock to 96 per cent minus 200 mesh for 3.00 to 3.25 K.W.H. per barrel—about 1/2 to 2/3 the average for the industry.

Eight installations of this type have demonstrated power and other savings that you can't afford to overlook if you are about to build a new plant, modernize an old one or shift from dry to wet processing.

◀ Step 3—Dorr Thickeners concentrating classifier overflow to slurry density.

Step 4—Dorr Slurry Mixers correcting the thickened slurry ahead of rotary kilns ▶



A 15 page technical reprint on Dorr C.C.G. is yours for the asking—flowsheets, operating data, cost analyses, etc.

THE DORR COMPANY INC.

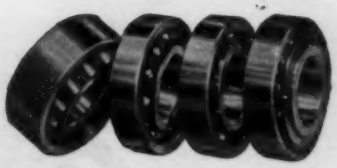
ENGINEERS • 570 Lexington Ave., New York

ATLANTA • TORONTO • CHICAGO • DENVER • LOS ANGELES

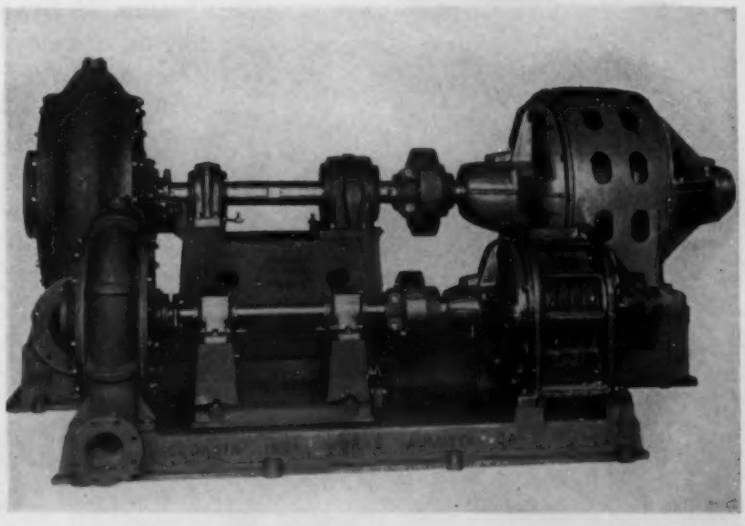
DORR TECHNICAL SERVICES AND EQUIPMENT ARE ALSO AVAILABLE FROM THE FOLLOWING COMPANIES:

NETHERLANDS: Dorr-Oliver N.V., The Hague • ENGLAND: Dorr-Oliver Company Ltd., London • GERMANY: Dorr Gesellschaft m. b.H. Berlin • FRANCE: Soc. Dorr-Oliver, Paris
ITALY: S.A.I. Dorr-Oliver, Milan • JAPAN: Sanki Eng. Co., Ltd., Tokyo • SCANDINAVIA: A.B. Hedemora, Hedemora, Sweden • AUSTRALIA: Crossle & Duff Pty. Ltd., Melbourne
ARGENTINA: Luis Fiore, Buenos Aires • SOUTH AFRICA: Edward L. Bateman Pty. Ltd., Johannesburg • BRAZIL: Oscar Taves & Co., Rio de Janeiro

Why does GEORGIA *select* SKF *for* THEIR PUMPS?



After several years' research and experiment, this pump has been developed to meet conditions of production and service "far beyond that of conventional types of pumps now on the market. Actual field tests have shown that these pumps give exceptionally high and sustained efficiency, low maintenance costs, together with production far in excess of the normal capacity."



BUILT BY GEORGIA IRON WORKS

WHAT LED The Georgia Iron Works, after consulting with a number of leading antifriction bearing manufacturers, to select SKF Bearings for this Sand and Dredging Pump? The answer is the same as the one that engineers in *all* the fields of Industry are giving whenever they show a preference for a tough-job bearing on a tough-job machine.

SKF Spherical Roller Bearings have a self-aligning feature which permits them to take extreme loads of high head and heavy duty under severe vibration and adverse working conditions. They eliminate wear at the stuffing box because they're correctly designed, easy to mount and remove, and assure correct alignment. They lock firmly, have ample capacity, and are effectively sealed against lubricant leakage, dust, dirt and moisture. They can do as much for *you,* so see your nearest SKF representative . . . TODAY. 4654

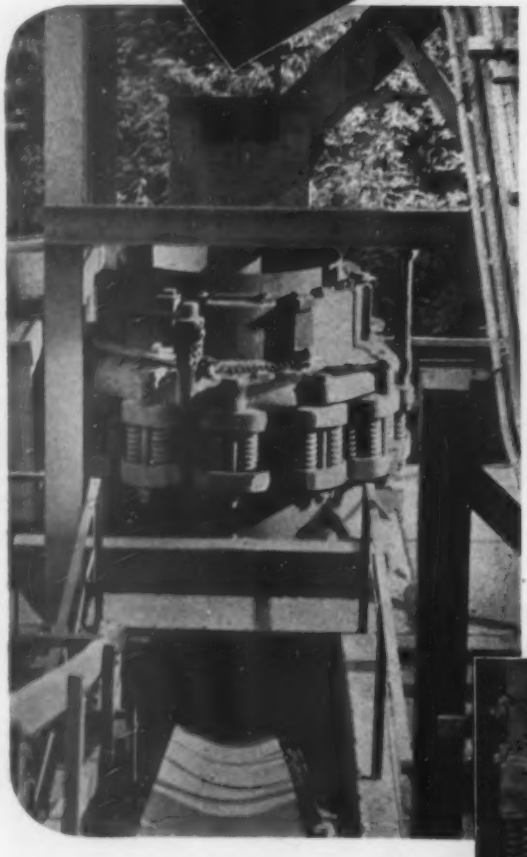
SKF
BALL & ROLLER BEARINGS

SKF INDUSTRIES, INC., FRONT ST. & ERIE AVE., PHILA., PA.

THIS COMBINATION REDUCES COSTS

Make those minus 1/2" sizes with a

SHORT HEAD CONE



Among the rapidly growing list of Cone Crusher users are many which have installed Short Heads to follow their original installations of Standard Cones. The Short Head was developed to provide minus ½ inch materials for which there is a constantly growing demand. Records of plants using these Crushers show that these finer sizes are made at a lower cost and in greater quantity than is possible with any crusher now available. The combination of Standard and Short Head Cones permits of greater flexibility and economy of operation and will produce just the sizes needed and in the amounts to meet present day demands for finer crushed materials.

NORDBERG MFG. CO.

MILWAUKEE, WIS.

NEW YORK
60 East 42nd St.

LOS ANGELES
Subway Term. Bldg.

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Concourse Bldg.

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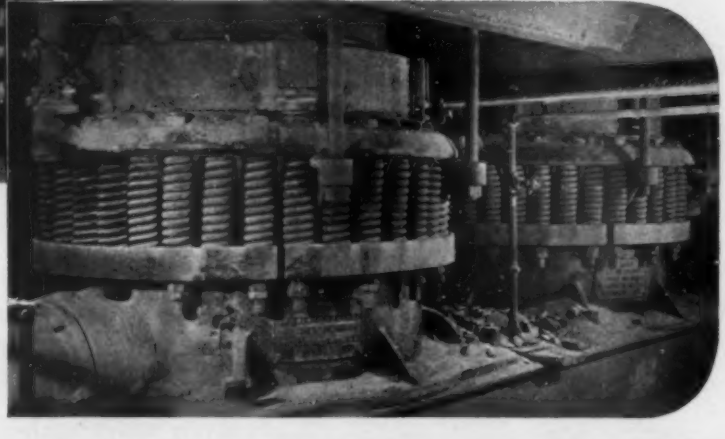
Bush House



Three four-foot Symons Cone Crushers are installed at this rock crushing plant. The two Standard Cones first installed to do the ordinary reduction crushing have since been followed by the Short Head to make the finer sizes.

SYMONS CONE CRUSHERS

This $1,000,000 project requires moving over 500,000 yards of dirt and rock. Gulf lubricants and fuels insure the maximum efficiency of all equipment.

Below: A Gulf engineer consulting the Supt. of Construction regarding a lubrication problem.

"Gulf's HIGHER QUALITY FUELS
and LUBRICANTS are giving us the
Benefits of REDUCED OPERATING
COSTS on this project"
. . . says this Superintendent

"Our modern equipment performs at peak efficiency . . . *thanks to the practical* recommendations made by the Gulf Engineer!"

"Working on a hard, fast schedule our operating costs covering this job have been very low—thanks to the high quality of Gulf fuels and lubricants," says this Contractor. "Gulf lubricants give us the protection that insures low maintenance costs and increases equipment efficiency."

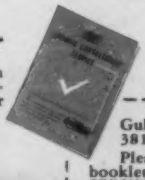
As a safety measure, operating men on scores of contracting jobs rely on the Gulf engineer to recommend proper application of oils and greases exactly suited to each piece of equipment and the conditions under which it works.

If you are interested in getting greater efficiency from your equipment—and lower maintenance costs —call in the Gulf engineer today. This cooperative service is available in 30 states from Maine to New Mexico. 1,100 strategically located warehouses insure prompt delivery of Gulf fuels and lubricants — no matter where your job is located.

The contracting firm, Benjamin Foster Company, Philadelphia, Pa., is working on The Indian Rock Dam on Cordorus Creek in York County, Pennsylvania. A leader in the construction field, this firm has standardized on Gulf fuels and lubricants on this job.

SEND FOR THIS BOOKLET

This booklet will suggest to you a *practical* method by which you can reduce operating costs. Write for your free copy.



GULF INDUSTRIAL LUBRICATION

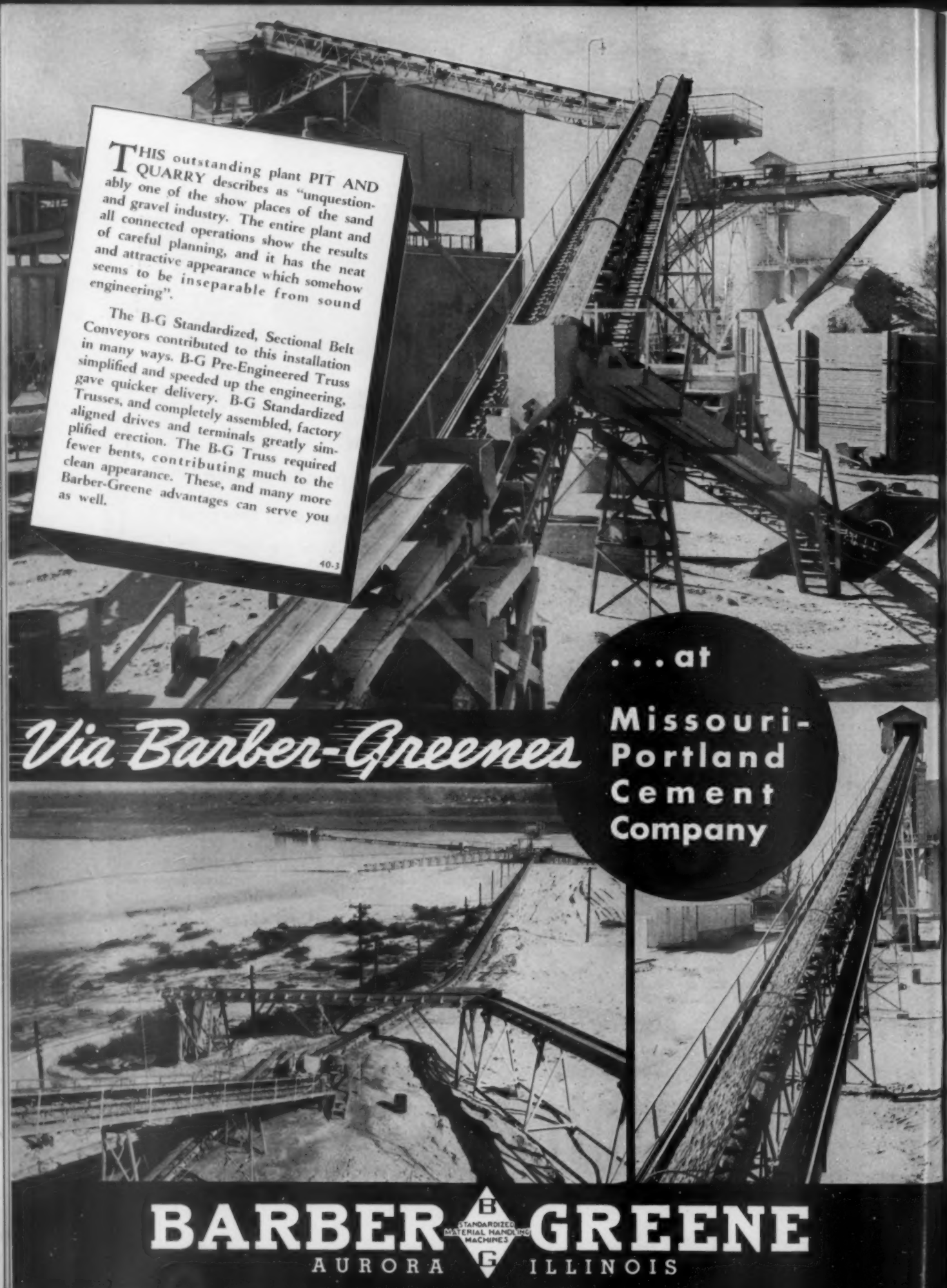
Gulf Oil Corporation - Gulf Refining Company
3813 Gulf Building, Pittsburgh, Pa. R P.

Please send me my copy — no charge — of the booklet "GULF PERIODIC CONSULTATION SERVICE."

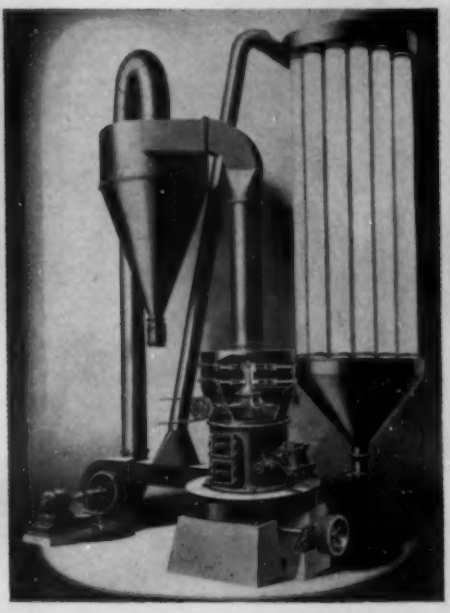
Name.....

Company.....

Address.....


THIS outstanding plant PIT AND QUARRY describes as "unquestionably one of the show places of the sand and gravel industry. The entire plant and all connected operations show the results of careful planning, and it has the neat and attractive appearance which somehow seems to be inseparable from sound engineering".
The B-G Standardized, Sectional Belt Conveyors contributed to this installation in many ways. B-G Pre-Engineered Truss simplified and speeded up the engineering, gave quicker delivery. B-G Standardized Trusses, and completely assembled, factory aligned drives and terminals greatly simplified erection. The B-G Truss required fewer bents, contributing much to the clean appearance. These, and many more Barber-Greene advantages can serve you as well.
40-3
Via Barber-Greenes
. . . at
Missouri-Portland Cement Company
BARBER GREENE
STANDARDIZED MATERIAL HANDLING MACHINES
AURORA ILLINOIS

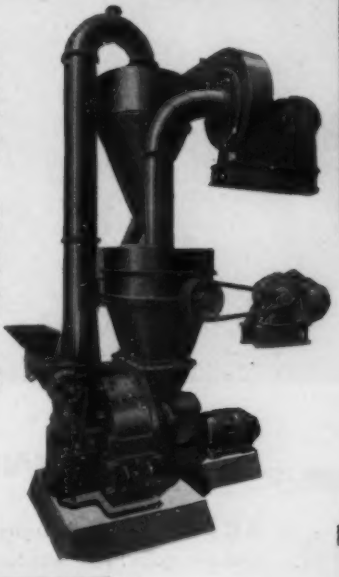
MAKING *Medium and Superfine...* MATERIALS *is a* RAYMOND JOB

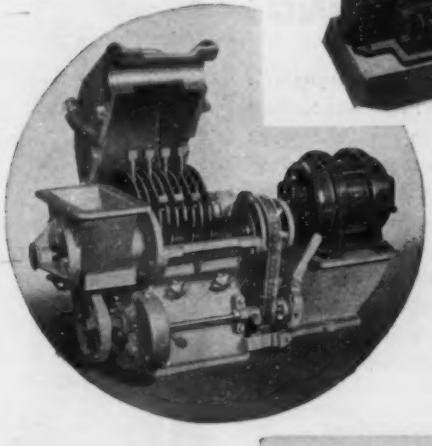


For the reduction and classification of materials to uniform powdered products, there is a Raymond machine to do the job economically . . . whether the operation involves drying, grinding, separating, or a combination of all three.

Calcining gypsum, drying and pulverizing limestone, handling clays, kaolin, phosphate rock, dolomite, burnt lime and other non-metallic minerals, are typical applications of Raymond equipment.

Write for a Raymond Catalog, mentioning your requirements as to capacity and fineness.





Raymond ROLLER MILL

with

Double Whizzer Separator

On this machine, you can produce a variety of grades from 80% passing 100-mesh to 99.9% through 325-mesh. Fineness is easily regulated by setting the whizzer speed control dial while mill is running.

Raymond IMP MILL

Whizzer-equipped

Flash Drying, optional

This compact unit may be used for drying, grinding and separating in ONE operation. Also for cooling materials that tend to heat in pulverizing. Highly efficient for calcining gypsum and similar jobs.

Raymond SCREEN MILL

For reducing soft and medium hard materials to uniform fineness. Made in six sizes for a wide range of capacities. Ask for Bulletin No. 39.

SINCE 1887

Raymond LABORATORY MILL

This is a complete motor driven unit that is suitable for grinding a few pounds of materials at a time. It produces the same character of finished material as the large commercial pulverizers, and is useful for running tests or developing new products.

Ask for Bulletin No. 48 which also describes Laboratory Separators

RAYMOND PULVERIZER DIVISION

COMBUSTION ENGINEERING COMPANY, INC.

1307 North Branch Street CHICAGO

Sales Offices in Principal Cities • • • In Canada: Combustion Engineering Corporation, Ltd., Montreal

KEEP MOVING!

ACTION is today's keynote... and one quick, sure way to meet new peak demands is through increased efficiency in your material handling system. EASTON industrial haulage equipment is built to last in service long after present emergencies have been forgotten. But a practical EASTON survey of your immediate requirements will help you to select standard or special equipment designed to save you time and money *now*. Cooperation and prompt deliveries are assured on every order.

WHAT IS YOUR HAULAGE PROBLEM?

For more than a quarter-century Easton has been supplying material handling equipment for every industrial service. Easton designs and builds all types of industrial cars, truck bodies, electric trucks and trailers. Consult Easton now for details on recent developments in wheeled haulage which might be applicable to your problem.

EASTON

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA.

LEADERS CAN HELP LABOR

FOR TWO DOLLARS more a week, one-third of all the workers would "sell out" their jobs. So reports the public relations firm of Remsen J. Cole, in making a cross-section survey of Philadelphia workers to determine basic causes of employee-management distrust. The survey suggests that management improve relations by (1) disseminating information on the company's financial status—only a quarter of the employees polled considered their wages fair; (2) cultivating personal relationships—only a third knew their employers well enough to speak to; (3) providing opportunities for advancement; (4) improving working conditions.

The quotation above is from a *Members' Service Letter* of the Employers' Association of Chicago. It puts emphasis, as do all such discussions, on *employers'* responsibility to improve labor relations. We think it time more emphasis was put on labor's responsibility, and particularly on the responsibility of labor's leaders, or union executives. Too much has already been said about the part of industry and government in making a success of our American commonwealth.

Through the manipulations of a well-known labor leader this country's defense program has been put in jeopardy by the proposal to use government contracts with industry as a means of enforcing the decisions of the National Labor Relations Board. Because of the pressure of public opinion the issue has been pigeonholed, but it is not dead and may soon arise again.

The thing that interests us in this connection, aside from the threat to tie-up our defense preparations, is that the proposal is entirely logical. The government contractors and suppliers are compelled by their contracts to live up to the Walsh-Healey Act which provides for fixing hours of labor and minimum wages, and there is no public sentiment against this method of enforcement. But the National Labor Relations Act is a horse of another color, and neither employers nor the public believe the law fair, and its administration by the Labor Board is universally conceded worse than unfair. A law so manifestly unfair with an administrative board so obviously biased just can't be enforced because its enforcement is against the public interest. Honest and capable labor leaders should be as susceptible of seeing that as are industry and the public.

The law itself was intended by the Congress to compel employers to accept collective bargaining, and few employers now object to collective bargaining with their employes. It was written and has been administered for the sole purpose of harassing and bullying employers. A great many employes in industry are beginning to realize that their labor or their offers of labor are not worth much without the supervision and management of capable employers. But some stubborn labor leaders do not or will not recognize this.

It is depressing to sit in with employers, either singly or in groups, and to listen to their trials and tribulations caused largely by maladministration of this single law. Yet we are hopeful and optimistic. The apparent simplest way out appears to be revision of the law or a change in the personnel of the National Labor Relations Board or both. But Congress and Labor Boards will always bungle. The eventual solution must come from labor itself through selection of capable intelligent leadership.

Industry pays large wages to men who can sell the products of labor. It is constantly picking and training the most capable men it can find. On the other hand labor often picks the most incompetent men to sell the only thing it has to sell; or it acquiesces in the leadership of plain racketeers, who have no interest but their own selfish ones to consider. Labor could well afford to seek out and employ the highest salaried, capable executives to do their collective bargaining.

That isn't a far-fetched dream either, for we quote from a speech made in Boston last April by a man who is recognized as one of the greatest of industrial executives, William S. Knudsen, now giving his time and services to his country without any compensation as a member of the National Defense Advisory Commission, who said when president of General Motors Co.:

"The greatest need in the labor picture today is for better management on the labor side. The technique of getting men out on the street is perfect, the picket line is as perfect as the Coldstream Grenadiers used to be—when it comes to getting the men back in again, the scheme is not so good. We had a strike in Detroit last fall in which 50,000 men were on the street for seven weeks and lost about $260 in wages each, on the average. They went back for a three-cent raise per hour, which on a 40-hour week means $1.20 per week or five years before they are even with the board.

"You will say: Why didn't the company give it to them in the first place and get the men back to work? Simply because the leaders had so many other impossible demands which had to be disposed of in negotiation before they got down to negotiate something tangible. I have every confidence that this sort of arithmetic in strike settlements is on the way out and that the men themselves will take matters in hand and elect leaders not of the Blitzkrieg variety. Common sense always wins out in America in the long run."

Nathan C. Rockwood

NEWS AND COMMENT

Material Orders Coming

"HEAVY CONSTRUCTION ACTIVITY," says the *Wall Street Journal*, "in this country is now at the highest level in history and indications are that volume for the full year, despite a slow start, will approach the 1929 total of 4 billion dollars." Yet a group of aggregate producers, representing most of the country east of the Rockies, reporting to each other around a table, gave the impression that except for a few spots, they had felt no impact from all this "heavy construction." The answer to this seems to be that most of this heavy construction, like our 50,000 war planes, is "on order."

Normally there is a lag of three to six months between letting of contracts for construction and delivery of materials for construction. Maybe, because of the urgency of much of this construction, the lag now will be less. On the other hand because of bottlenecks and confusion in Washington, D. C., the lag may be longer. Anyhow, producers will do well to make themselves very familiar with projects in their locality, for unless figures do lie, there is going to be a tremendous demand for materials a few months hence. Very likely the demand will be spotty, but producers in the line of march had better be getting ready.

Free Speech Assured

ONE RECENT DECISION by a United States Circuit Court of Appeals was particularly gratifying to the editor of ROCK PRODUCTS because we cherish the freedom of the press and the right of free speech, and also because we long ago predicted no United States court could rule otherwise, although at the time there were a lot of people predicting otherwise.

In the early days after the passage of the National Labor Relations Act a strenuous attempt was made by the C.I.O. to organize the Ford Motor Co. employes. Notwithstanding that the Act specifically prohibits the employer from attempting to influence his employes, Henry Ford did not hesitate to express his opinion of unions in general and of this attempt to unionize in particular. One did not have to agree with his arguments to see the justice of his right to express his views as he saw fit.

Ever since then the National Labor Relations Board has been trying "to get" Henry Ford. Among other things it ruled he violated the law in advising his employes not to join the union. The U. S. Court of Appeals at Cincinnati, Ohio, has ruled that even the N.L.R.B. cannot deny Mr. Ford or any other employer a right guaranteed by the first amendment to the Constitution of the United States. We don't believe the Supreme Court could possibly reverse this decision, because the issue is so obvious.

Incidentally, it is entirely within the range of possibilities, even probabilities, that even if the National Labor Relations Act does stay on the statute books without change, the rights of employers will slowly but surely be recognized—not because they are necessarily inherent rights, but because the public will see the justice of restoring them, and the necessity of restoring them for its own self interest.

High-Priced Limestone

A NEW SOURCE OF CALCITE, crystallized calcium carbonate, or Iceland spar, a valuable optical mineral heretofore imported, was revealed when officials of the Bausch & Lomb Optical Co., Rochester, N. Y., announced they had contracted for the output of a new mine in the San Pedro mountains, northwest of Santa Fe, N. Mex.

Discovery by a Mexican prospector of the new source of supply and the interest of E. M. Stanton, a Chicago optometrist, led to a subsidy by the Bausch & Lomb Co., through which operations have been conducted. Officials reported that the new mine had delivered more than 500 lb. of fine calcite crystals, many of them weighing as high as 40 lb., within three months. An analysis of the new mine's output indicates that the United States now has a supply of calcite of high optical quality which will serve the country for years.

The scarcity of optical calcite has caused a world-wide search for many years, since the mineral is essential in the construction of all polarizing instruments. With the flooding of the Iceland mine at Helgustadir during the World War, this source which formerly supplied the world has been unproductive of fine crystals. Meager supplies have come from various countries, most recently from Spain and South Africa, but the total volume offered for sale has been insignificant for many years.

Central American Opportunities

OUR MAIL the past week brings a request to find a cement plant chemist for a new South American plant, a letter from a cement friend who has recently flown over several Central American countries, and a monthly U. S. Bureau of Foreign and Domestic Commerce report that Uncle Sam is loaning $4,600,000 to Costa Rica for 356 miles of the Inter-American highway (some $2,500,000 was recently loaned to Nicaragua). A recent visit with Canadian government officials proved that Canada is hot after American dollars loaned or given to our neighbors "south of the border."

The letter from our flying friend says he sees many possibilities in all these countries and "expects to see things popping down this way shortly" in the cement and lime industries; lime because they have begun to use large quantities to spray banana plants. He says, "from what I have seen I am ashamed of the progress made by United States industrialists. Things are ripe for a boom down this way, but not on the methods by which business in the U. S. is conducted. This is fertile ground and if handled properly warrants considerable American investment."

Few American men of business look upon our "loans" to Central and South America as anything but gifts of our taxpayers' money, so instead of beefing about them, we might get in line to bring some of it back through exercise of a little more enterprise.

Highway Tax Diversions

IT IS an interesting, sad commentary on government inefficiency that at the very time this country appears in most need of extensive highway reconstruction, new records in diversion of the money raised by taxation of highway users for highway construction are being established.

Of the total $1,252,205,000 collected from motor vehicle owners for their use of the highways in 1939, the states spent $181,654,000, or 14.8 cents of every dollar, for non-highway governmental activities. The previous high in such diversions was in 1936 when the total amounted to $169,344,000. These totals do not include any so-called "possible diversions" to non-highway purposes of state highway funds that were allocated to local

subdivisions for roads and streets but without definite requirements as to how the money should be expended.

In addition to these special highway user taxes of more than one and one-quarter billion dollars, motor vehicle owners are estimated by the National Highway Users Conference to have paid in 1939 upwards of six hundred million dollars in real and personal property taxes, state and other sales taxes, and federal excise taxes. These represent the highway users' contribution to general governmental expenses. They bring the total tax bill in connection with the ownership and operation of motor vehicles to the neighborhood of two billion dollars, not including the federal income or pay roll taxes paid by the motor carriers.

"National defense requires rebuilding and improving important mileage in the strategic highway system," the Conference report says. "In the past ten years, sums aggregating $1,348,000,000 of the special taxes collected from highway users have been diverted from highways by the states. Had this money been properly expended on the main highway system, many of the present national defense needs would have been provided for and to that extent large expenditures on existing roads would not be required at this time."

Correcting an Injustice

BY THE TIME this is published the election will be over, so this isn't written with the idea of influencing the election. But we doubt if many intelligent youngsters voted for continuing the New Deal another four years because it has been so manifestly unfair to them. It has discouraged them from hoping for better days by assurances that "those days are gone forever;" it has prevented opportunities in private industry by discouraging private enterprise; it has discouraged employment of youngsters by the army draft threat, and, to our mind, by an absurd interpretation of the Wage and Hour Act has discouraged and prevented ambitious youngsters from getting ahead by denying them the right to work overtime to learn essentials necessary to get ahead.

Fortunately under Col. Fleming's administration a new interpretation was issued October 7, forced apparently by the shortage of skilled men in industry, but broad enough to lift the ban on ambitious youngsters who want to learn the ropes in the management ladder on their own time. An employe may now put in time that his employer does not have to report and pay for as overtime if:

(1) Attendance on the part of the employe is in fact voluntary. No training program shall be considered voluntary if a condition of the employe's continued employment in his present job is attendance at the training program.

(2) The employe shall not produce any goods or perform any other productive work during such periods of training.

(3) The training course must be given outside of regular working hours.

(4) The training course is intended to train the employes to a new, different, or additional skill, and is not intended to make the employe more efficient at doing what he has been doing in his present job.

The last provision (4) would be rather hard to fulfill if the youngster were attempting to prepare himself for an executive or management position, for obviously he would be trying to increase his all-around efficiency. This provision is evidently written for the benefit of labor unions which are afraid of speed-up programs. Indeed it is the union that is withholding many opportunities for youngsters. We know of one large cement company which formerly employed several young men every year as laborers merely to let them learn the first principles of the business and with the intention of picking out the good ones to train for future executive jobs. Now the company can't do this because the union says who shall or shall not be put on the pay roll; and seniority rules require an oldster where an ambitious youngster would have had the job.

To illustrate our point we have before us a quarterly report of the National Gypsum Co., which has a page entitled "Plant Personnel." Portraits of four executives of the Akron, N. Y., plant are shown together with thumbnail biographical sketches. The general superintendent started as a construction laborer when the plant was built; the board mill superintendent started in a similar way and his first job in the plant was that of an oiler. The superintendent of the plaster mill started in the gypsum mine cleaning out cars. The superintendent of mining started as a laborer and brakeman of a mine locomotive. Presumably young men starting today as these men did several years ago can still get to the top, in spite of the discouragements of the government and the labor unions. More power to them, they'll need it.

Advance Planning

THESE ARE CURIOUS TIMES. While we in this country are preparing for "total defense," which most intelligent people think really means offense, our particular "enemy," Germany, has drawn up an elaborate program for large-scale construction of new dwelling houses upon the restoration of peace. The housing program, according to the American consul, Frankfort-on-Main, is designed with dual objectives: (1) To assist the nation to adjust itself to peacetime conditions by creating new employment for industries and large masses of workers now engaged on armament production, and (2) to create additional dwellings to relieve the existing housing shortage caused by the growth of population, acceleration of the national economy in recent years, and lack of new construction during the war.

The housing program contemplates the construction of about 6 million dwelling units over a period of 10 years, involving the expenditure of between 6 and 8 billion marks annually. Construction on the projected scale will be about three times that of the years preceding the war, when it was already lagging behind national requirements.

This projected vast scale of construction is expected to give great impetus to the numerous industries manufacturing building materials such as lumber, bricks, cement, tiles, metals, glass, chemical products, etc.

Unlike housing programs carried out in pre-war years, says the consul, when construction was confined almost entirely to very small dwellings of minimum cost, the postwar program contemplates construction of a wider variety of houses, including a much larger proportion of larger-sized dwellings with more than three or four rooms for comfortably accommodating larger families.

This scheme evidently is based on expectations of a triumphant Germany and that the German people will enjoy the fruits of victory in larger houses with larger families; or of course it may be just a sop to induce the German people to keep up the struggle for world supremacy. Don't ask where the money is coming from. After the 1914-1918 world war most of the money for home building in Germany came from the United States in the form of loans that never were repaid. Under the present setup, apparently, they don't need money or credit.

Resize and Wash Rock

As Part of Carloading Operation

By ROYAL E. FOWLE*

SPACE LIMITATIONS introduced a difficult problem in building the new washing plant of the Granite Rock Co. The quarry site is located in Chittenden Pass in San Benito County, Calif., where the pass narrows down, allowing only room for the Pajaro River, with the highway on one of its banks and the main double track line of the Coast Division of the Southern Pacific Co., a passing track and three loading tracks on its other bank. It was therefore necessary to blast and remove part of the canyon side to make room for some of the original construction on the main crushing and screening plants, as well as the reduction plant, Fig. 1.

Installation of the original dry-cleaning screen at this plant did not offer much of a problem as it was only necessary to install a horizontal 4- x 10-ft. screen near the mixing belt head pulley at the car loading point. The fines or "throughs" from this screen were removed by means of a 48-in. horizontal conveyor placed directly under the horizontal lower screen deck. This belt, in turn, discharged on to a 14-in., 18-deg. inclined conveyor which returned the fines to a rock storage bunker placed ahead of the reduction plant crushers. This dry-cleaning screen, the feed and return belts, were removed and used in the new plant.

The combination of a washing screen following a dry rock resizing and recleaning screen offered quite a problem due to the lack of room and means of obtaining wash water, as well as a means of its disposal. The lack of room was by far the most serious, as it was necessary to maintain standard railway track and overhead clearances. It was also nec-

Fig. 2: Dry plant shown to the left with end view of washing plant and 24-in. conveyor connecting them. A 30-in. conveyor seen at left carries dry, crushed rock to a 5- x 14-ft. sizing screen
Fig. 3: Foundation for dry cleaning and resizing plant in background; foundation for washing plant in foreground

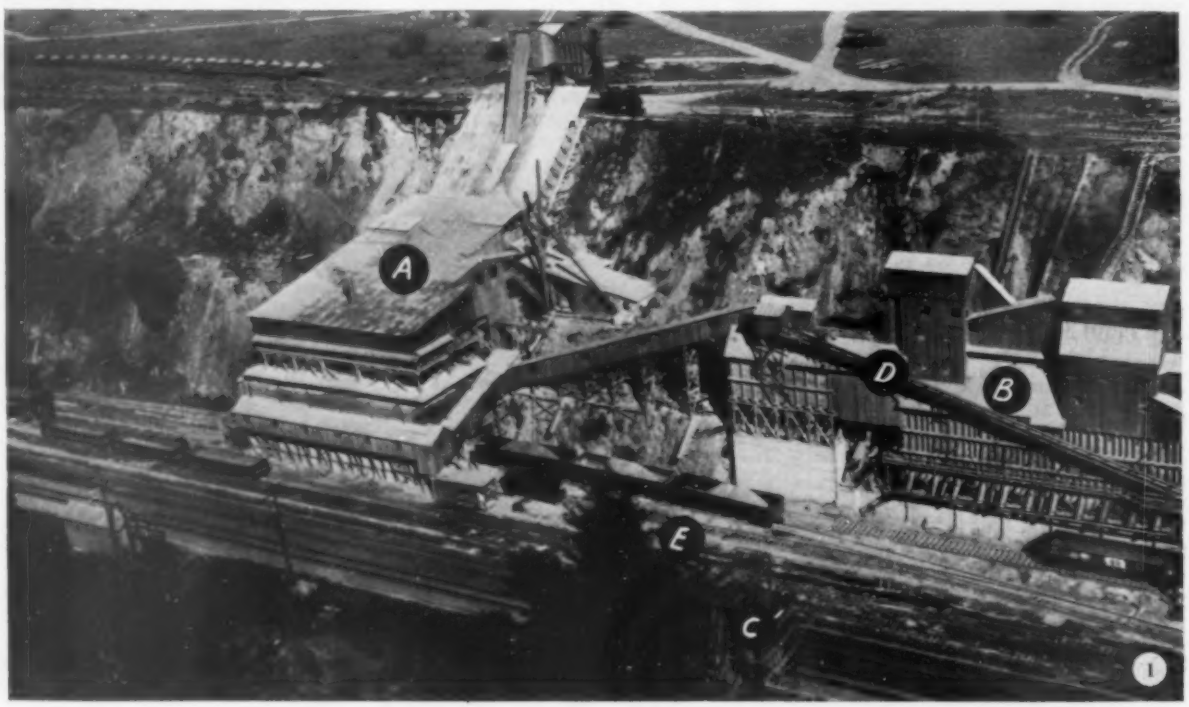


Fig. 1: Airplane view of Granite Rock Co. plant units. (A) Main crushing and sizing plant. (B) Main reduction and sizing plant. (C) Sand plant. (D) Original dry cleaning plant with 14-in. return conveyor, now removed. (E) Location of new dry cleaning and resizing plant, and the new washing plant

FOREWORD

IN THE July and August issues of ROCK PRODUCTS, an article entitled, Dry-Cleaning vs. Washing, traced the improvement in the quality of aggregate out of stockpile, from the method of direct crane-loading of cars from storage through the next step—resizing and dry-cleaning—to the final improvement, resizing and washing.

Resizing and washing of stockpile material made necessary the washing of the main reduction plant sizes so they could again compare favorably with those from storage. This was done by sending main plant and reduction plant sizes to the washing plant at stockpile where they were resized and washed. This processing taxed the operating capacity of the plant, as it also handled the material for the asphaltic concrete plant as well as that from stockpile. Demand for washed rock increased to the point where it became economical to install resizing and washing facilities at quarry plants. This article covers the layout problems, construction, and operation of washing plant.

essary to have ample track room for both empty and loaded cars. The location finally worked out for the washing plant was between the Southern Pacific Company's track No. 4 and the Granite Rock Company's track No. 1, as shown in Fig. 2. The dry-cleaning and resizing plant was placed straddle of our No. 2 loading track as shown in Fig. 3.

Dry, sized, crushed rock, coming on a 30-in. conveyor, as shown in Fig. 2, from either the bunkers of the main plant or those of the reduction plant, is run to a 5- x 14-ft. Robins sizing screen, as shown in Fig. 4. This screen has 3½ decks and a pan on the bottom, making 4½ decks. The usual screen cloth openings used for

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Group of plant executives. From left to right: R. E. Fowle, engineer; S. N. Edgmon, loading foreman; Frank Swearingen, superintendent; the late L. W. Bardt, construction foreman; George Day, crushing plant foreman; and Samuel E. Allen, master mechanic

resizing are 1¼, ⅞, ½ and ¼-in. Fines and free dust are removed from all of the rock sizes except ¼ to ⅛ in. and sent back to the main crushing plant by means of a 14-in. conveyor. The rock which has been resized and dry-cleaned by passing over the deck having the required size of screen cloth openings is discharged to a 24-in. conveyor which feeds the rock washing plant screen. If a customer requires dry rock rather than surface damp, the water is either shut off at the washing plant, or the 24-in. belt is bypassed and the car loaded by a chute directly under the dry plant screen.

Concrete rock (1½- to ¼-in. and ¾- to ¼-in.) proportioned on the 30-in. mixing belt from the reduction plant, is resized over the ¼-in. screen, while 1½- to ¾-in. is resized over the ⅞-in.; ¾- to ½-in. over the ½-in.; ½- to ¼-in. over the ¼-in.; 2½- to 1½-in. over the 1¼-in.; 2- to ½-in. over the ½-in., etc. The ¼- to ⅛-in., or birdseye, all passes

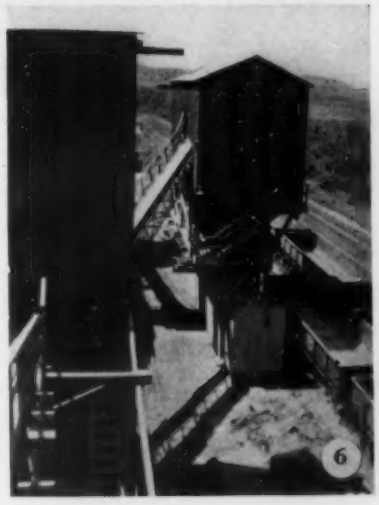


Fig. 6: Showing truss carrying 24-in. conveyor troughing rolls and connecting dry and wet plants

through to the pan or bottom deck from which it also discharges to the 24-in. belt conveyor, shown in the flow sheet, Fig. 5. This 24-in. conveyor feeding the dry-cleaning and

Fig. 4: Arrangement of dry plant screen, conveyors and chutes

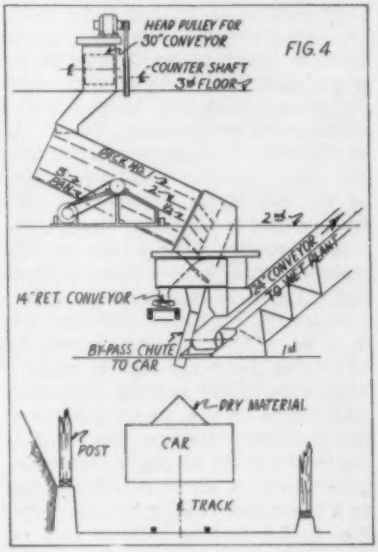


Fig. 5: Flow sheet of material from dry plant to washing plant

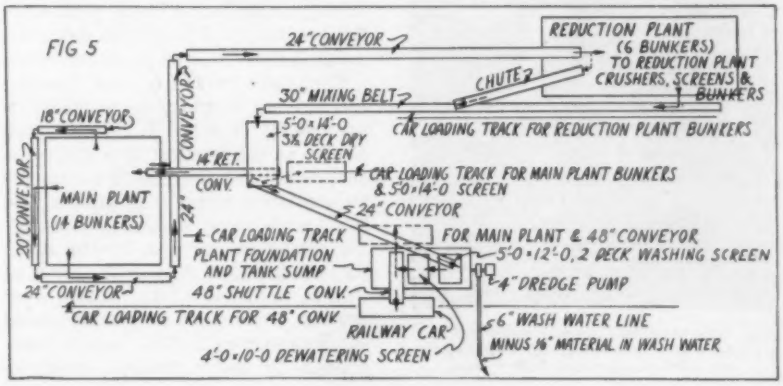


FIG 5
24" CONVEYOR
REDUCTION PLANT (6 BUNKERS) TO REDUCTION PLANT CRUSHERS, SCREENS & BUNKERS
CHUTE
30" MIXING BELT
18" CONVEYOR
CONVEYOR
5'-0 x 14'-0 3½ DECK DRY SCREEN
CAR LOADING TRACK FOR REDUCTION PLANT BUNKERS
14" RET. CONV.
CAR LOADING TRACK FOR MAIN PLANT BUNKERS & 5'-0 x 14'-0 SCREEN
MAIN PLANT (14 BUNKERS)
20" CONVEYOR
24" CONVEYOR
24" CONVEYOR
CAR LOADING TRACK FOR MAIN PLANT & 48" CONVEYOR
PLANT FOUNDATION AND TANK SUMP
5'-0 x 12'-0, 2 DECK WASHING SCREEN
4" DREDGE PUMP
48" SHUTTLE CONV.
CAR LOADING TRACK FOR 48" CONV.
RAILWAY CAR
6" WASH WATER LINE
MINUS ¼" MATERIAL IN WASH WATER
4'-0 x 10'-0 DEWATERING SCREEN

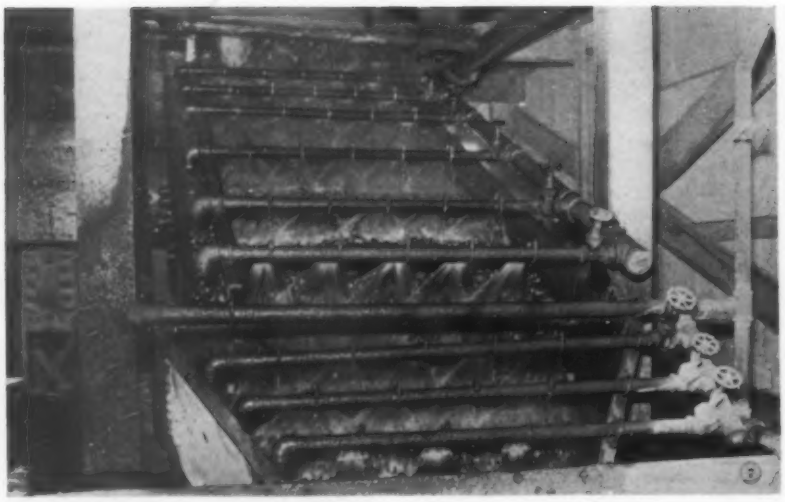


Fig. 7: Spray system on vibrating screen. Note how it is made as a unit which can be raised to a horizontal position for changing screen cloth. When raised, the spray unit rotates around the header, the pipe loosening about a quarter turn on the left hand turning at the Tee. When lowered the threads at the Tee are again tightened, eliminating the use of a swivel or swing joint

resized rock to the washing plant is carried on a steel truss, or bridge, placed between the "dry" and "wet" plants, as shown in Fig. 6.

Washing Operations

Rock going to the washing plant screen is discharged into a chute carrying a total of 23 high pressure sprays in seven banks. These sprays not only serve to wash the rock, but also slow its speed effectively. This speed can be reduced to nearly zero by heading the sprays into or directly against the rock flow. This, of course, is never done in the actual operation of the plant, but is cited only to show how effectively the rock coming off the 24-in. conveyor at 300 f.p.m. can be "braked" before it is discharged to a 5- x 12-ft. Robins screen, where it travels at the rate of only 60 f.p.m. It is here again washed while passing through seven banks of five sprays each, as shown in Fig. 7. This screen is equipped with ½-in. opening cloth on the top deck and ⅛-in. opening cloth on the bottom deck. The ¼- to ⅛-in. material which has passed over the pan "conveyor" on the bottom of the dry plant screen here loses its dust and other minus ⅛-in. sizes.

Rock passing over screen or discharging from it goes down a chute and through 12 additional high pressure sprays, Fig. 7, to the head end of a 4- x 10-ft. Symons screen set at 12 deg. Here the rock is given a final washing by passing through a single bank of five sprays located at the feed box discharge. The remaining length of the screen is used to dewater the rock before it is discharged to a horizontal shuttle belt conveyor, Fig. 8, for loading railway cars on tracks at either side of the washing plant.

A hose below the conveyor is used to supply water to very fine high pressure sprays discharging against the under, or return, side of the conveyor. These sprays are used to remove fine particles of rock which tend to cling to a damp belt and would otherwise pile up on the ground outside the car being loaded. The sprays, used only when loading fine sizes such as ½- to ⅛-in. and ¼- to ⅛-in., work more effectively than a rubber squeegee which was first used.

The dewatering section of the 4- x 10-ft. Symons screen has proved so effective that no water drips from the loaded cars, except those loaded with ½- to ⅛-in. and ¼- to ⅛-in. which, being sizes of higher surface area, show a consequent increase in percentage of moisture when compared with a like weight of larger sizes.

Fig. 11: Working space provided for pulling out worn 6-in. line and replacing with new, extra heavy pipe

Wash water from the chute feeding the 5- x 12-ft. Robins washing screen is carried to this screen and then down through its screen cloth, along with the water applied at the screen, to a hopper placed directly under it. The wash water from the chute feeding the 4- x 10-ft. Symons screen is similarly handled, along with the water applied at the head of the screen and that water shaken from the rock during the process of dewatering, as shown in Fig. 9.

Wash water is then carried by chutes into a tank, the walls of which serve as a foundation for the entire washing plant. These walls rest on a large heavy base slab, which serves as the tank bottom, the slab extending out to the ties of the tracks adjacent to the plant on either side. The plant has the appearance of being top heavy, due to its narrow foundation. However, the base is sufficiently heavy and wide; the heavy machinery loads are all well centered over the tank and the wind loads are taken care of by 1½-in. bolt stock rods running down through the frame and into the tank walls.

Washing water is pumped to the plant through a 6-in. line from the Pajaro River at the rate of 500 g.p.m. by a 40-hp. Fairbanks-Morse centrifugal pump, shown in Fig. 10, but only during the spring, summer and fall months, when the river water is clean and clear. During the winter months, when rains have raised the Pajaro River and caused the water to become muddy, it is necessary to obtain washing water from the quarry water storage tank. The pressure and amount of water from this source is reduced by adjusting the main valve, as the tank is 200 ft. above the washing plant, giving a static pressure of approximately 86 lb. This tank is fed through 3400 ft. of 4-in. pipe by a 200-hp. deep well pump, as described in the August issue of ROCK PRODUCTS.

The wash water in the washing plant tank foundation, or sump, is pumped by a 4-in. Kimball-Krough dredge or sand pump to a hydraulic dam or settling basin built across the Pajaro River where it is wasted. The 6-in. wash water discharge line, being subject to abrasion by the solids passing through it, was installed so that it could be readily turned over 180 deg. when signs of wear appeared at its lower half. This was accomplished by using flanged couplings

every third joint. Extra heavy 6-in. pipe was used where the line passed under the railroad tracks to the Pajaro river. This pipe was placed in an extra heavy 8-in. pipe which served as a casing. The 6-in. pipe was flange-coupled near the upper, or washing plant end of the casing, and a seal poured where it entered the 8-in. pipe in order that the wearing through of the 6 in. line would be indicated by the flow of water out of the lower, or Pajaro River, end of the 8-in. casing. A working space, as shown in Fig. 11, at this end allows room for pulling the worn 6-in. line and its replacement by new extra heavy pipe. The tank or sump solids are blown down by means of a 6-in. pipe entering the tank at the end opposite to the suction line. That portion of the base slab outside of the foundation or tank walls serves as a "drainboard" for any water from rains, car washing, or car drainage. The top surface of this slab slopes toward the end of the tank containing the suction line where a grate-covered sump is located. A 2-in. pipe connected to the main suction line and equipped with an automatic float valve, keeps this sump dry. The entire area over the projecting portion of the base, including the sump, is covered with 3- to 1½-in. and 1½- to ½-in. drain rock.

The Electrical System

The electrical system used in the operation of the washing plant is simple, yet effective in its operation. The eight plant motors, all of the type used for starting across the line, are either semi, or totally enclosed, as their locations demand. The control switch board is a built up type using externally operated switches, magnetic starters, and bussed gutter wiring.

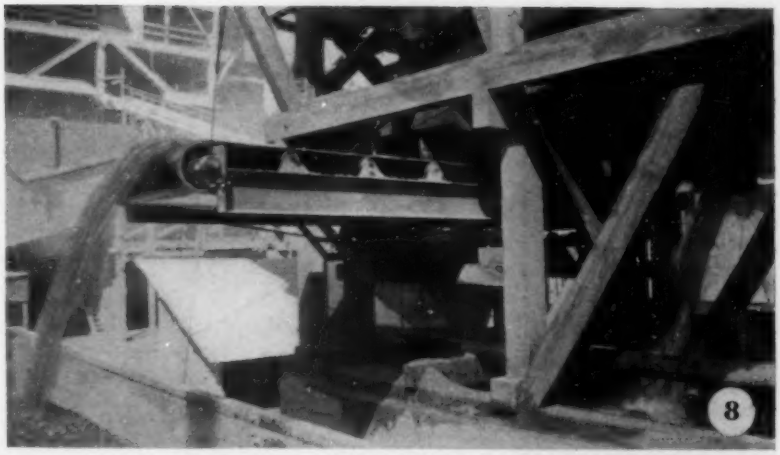


Fig. 8: Car loading shuttle conveyor, before installation of belt cleaning spray

The control circuits for these magnetic starters are so connected that in the event of failure of any individual motor, all of the motors in the train, or sequence, will stop; thus preventing the piling up of material at the original unit stopped or out of operation. This control is made possible by a series arrangement through the thermal cutouts of each individual magnetic starter. The push button station for each motor is individual and may be started or stopped at will, as the operator desires. The Kimball-Krough dredge pump motor and the Fairbanks-Morse water pump motor are not in the motor train. All push buttons are mounted in a bank and are numbered so that when starting, the operator pushes each from number 8 to number 1 button until all motors are in operation. This starting is in the reverse order; that is, the plant starts from the last, or shuttle conveyor motor, back to the first, or 30-in. feed conveyor motor, and is done to assure the operator that all the equipment is running before the plant starts taking material; thereby preventing a pile-up of the aggregate at loading chutes, conveyors, head pulleys, or screens.

Three stop-button stations are located at strategic points in the plant, permitting the operator to stop all equipment in the event of mechanical

Fig. 9: Arrangement of conveyors, screens, chutes and tank section of washing plant

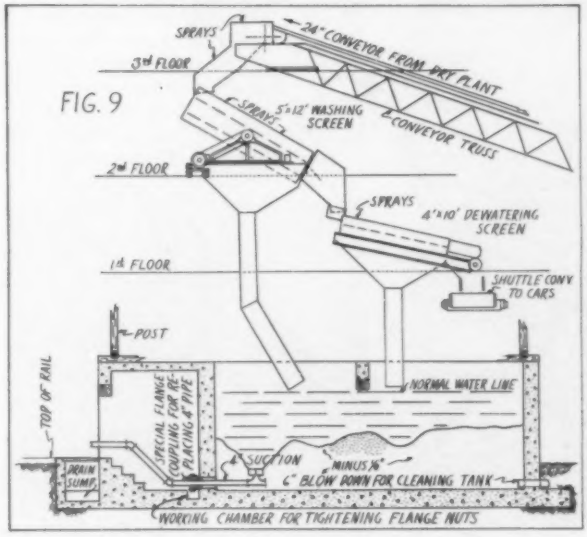
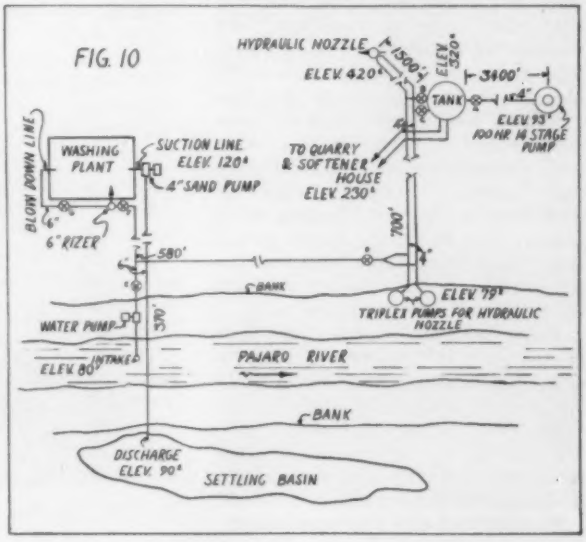


Fig. 10: Washing plant water system. For summer washing, when water is pumped from the river, valve D is closed and valves E and F are opened. Valve G is for the 6-in. blow down line for cleaning tank. For winter washing, valves A, B, C, D, and F are opened and valve E is closed. During hydraulicing, wash water is supplied to washing plant by Fairbanks, Morse pump, and valves D, B, and C are closed so the Dean Triplex pumps can pump to hydraulic nozzle



trouble or an emergency. Any of these buttons can be used to stop the plant when car loadings are completed. The car loading shuttle conveyor is equipped with two motors; one for running the conveyor belt and the other for moving the carriage to either loading side, so that cars may be loaded on either track located along each side of the plant. These motors are started by a push button connection to magnetic starters and a double throw switch cut in ahead of the starter for reversing the direction of rotation on each motor. Limit switches are installed under the conveyor carriage to take care of travel and an adjustable trigger is mounted on the traveling carriage for limiting the point where it will stop.

The Results

Operation of both the dry-cleaning resizing plant and the washing plant has been highly satisfactory. The production rate averages 360 tons per hour of well graded, clean, washed crushed rock.

Cars on the loading tracks at either side of the washing plant are moved into place easily as the tracks are on a slight downgrade. There is sufficient tail room on each of these tracks for storage of empty cars which are washed out before they are loaded. There is also ample room past the plant to the car clearance point to allow storage for cars as fast as they are loaded and drifted past the plant.

The washing system is particularly effective and outstanding during the winter months when the rains have wet down the rock in the quarry and caused the sized material in the main crushing and reduction plant bunkers to be damp and dust coated.

Concrete strengths have been increased by the use of washed Granite Rock as a coarse aggregate compared with that using Granite Rock not washed; all other factors being equal. The State of California record for concrete paving strength in 1929 was 5238 p.s.i. The Granite Rock Co. concrete record for this year was 5136 p.s.i. representing an average of several hundred "breaks" made by Abbott A. Hanks, Inc., Testing Laboratory, San Francisco, Calif. Structural concrete has also showed an increase due to the washed Granite Rock; all other factors being equal.

These increases in strength are probably due to the increase in available bond area and bond strength, as the minute pockets in the slightly rough rock surface are exposed, giving greater bond area, while the rock surfaces are cleaned and made ready for greater bond strength.

Washing has also improved the effectiveness of Granite Rock when used for seal coat, armour coat, penetration macadam, and other work using hot asphalts, cut-backs, or emulsions.

Phosphate Deposits of Tennessee

BULLETIN 48, published by the Division of Geology, State of Tennessee, under the title "The Phosphate Resources of Tennessee" is a thorough report on the occurrences of phosphate deposits, how they are mined and the future of the phosphate industry in that state. Tennessee, ranking next to Florida as the largest producer of phosphate in the United States, has an annual production valued over $3,500,000.

Much of the report is based on geological investigations of the various deposits and how the industries based on them operate. All known deposits are described as to origin, composition and as to their possible importance if exploited in the future.

Considerable space is given over to a discussion of operations at the principal washing and recovery plants in the important Mount Pleasant producing area, with emphasis on recent trends and developments which have boosted recovery, such as flotation and nodulizing plants. Charleston Mining Co., Inc., for example, put in flotation in 1934, and in 1938 installed a nodulizing plant to prepare phosphate for use in the production of elemental phosphorus. This latter process consists in feeding wet fines, phosphate muck or small lump rock into 8- x 120-ft. coal-fired rotary kilns where, under temperatures up to 2300 deg. F., the phosphate is rolled into semi-spherical shapes. These spheres are crushed and sized. This development is significant in prolonging the reserves of phosphate since material of lower grade is usable in the process of making elemental phosphate in electric furnaces.

These trends in new markets and toward more efficient recovery equipment in the last 15 years have altered the picture as to the reserves and future of the industry. Technological progress, such as the introduction of flotation, which has made it profitable to re-work "exhausted" land and even dump piles of overburden, and the comparatively new market for lower grades of phosphate in the manufacture of phosphorous by the electric furnace method have made the future of the industry and of the reserves much more optimistic.

Authors of bulletin 48 are Richard W. Smith and Geo. I. Whitlatch. Mr. Smith was formerly assistant geologist, Tennessee Geological Survey; later State Geologist, Georgia Department of Forestry and Geological Development and Geologist, Georgia Division of Mines, Mining, and Geology. Mr. Whitlatch is Associate Geologist, Tennessee Division of Geology.

An All-Electric Walking Dragline

MATERIAL SERVICE CORP., Chicago, Ill., opened a deposit of sand and gravel early this year at Plainfield, Ill., which is being excavated to produce aggregates for the plant at Lockport, Ill. Excavation as well as stripping is being done by a type 7200 Marion walking dragline, which is the first dragline of that type manufactured by the Marion Steam Shovel Co. for the rock products industry. It is equipped with full Ward-Leonard electric control and has a 110-ft. boom with 5½-cu. yd. bucket.

This machine is excavating an average of about 600 tons per hour and loading 70-ton railroad cars for direct delivery a distance of eight miles to the washing plant.

Walking dragline recently purchased by Material Service Corp., loading 70-ton gondola cars

General view of plant showing conveyor from plant bins, to the right; used to stockpile, fill batching bins, loading cars or barges; and in center, reclaiming conveyor under stockpiles

Better Allegheny River Gravel

Use both cone and impact type crushers and add more screening surface to improve quality of gravel

By BROR NORDBERG

AGGREGATES of higher quality are being produced by J. K. Davison and Bro., Pittsburgh, Penn., since its New Kensington, Penn., plant was rebuilt and the dredge design changed. This concern dredges sand and gravel from the Allegheny River near Pittsburgh, and is one of several producers in this area that have made important plant changes, particularly toward the elimination of soft particles which exist in the river bed.

Loss on the Los Angeles rattler test was a little higher than desired and practically all the large Pittsburgh producers have made some form of plant change to better the condition.

Los Angeles Rattler to make soundness tests of aggregate samples

Davison's plant at New Kensington is a land plant, receiving raw material in barges operating from the dredge. Sand is classified and finished on the dredge while the coarse aggregates are crushed and graded at the land plant and two other locations, which serve as retail plants and shipping points.

Gravel is delivered to the plant, 550 tons to a barge, and placed in a raw material bin by a 2-cu. yd. steam-driven clamshell bucket manipulated by a stiff-leg derrick. The layout consists of a long expanse of land for stockpiling paralleling the river edge with the plant at one end, and includes all the facilities for loading finished material into railroad cars, trucks, barges or into batching equipment. Stockpiles are built up over a reclaiming conveyor tunnel in a long row parallel to the river, which makes the entire operation very adaptable to change.

Practically all incoming material is from 2- to 6-in. size round gravel, and production is geared to produce a variety of blends of uncrushed and crushed gravel. Raw material is fed out of storage on to a 30-in. belt conveyor feeding a 4-ft. Symons cone crusher, and the crusher product is elevated by bucket elevator, 82-ft. centers, to a scalping screen at the head of the plant.

Use of Impact Type Crusher

Principal changes in the plant are the addition of the scalper, a 4- x 8-ft. Simplicity triple-deck vibrating screen and a Stedman impact-type

Gilson shaking screen for making test analyses of materials

Vibrating feeder which regulates flow of large stone to belt feeding cone crusher. Bucket elevator, to the right, takes product to scalping screen

Left: Cone crusher (4-ft. size) receiving material from raw storage bin

"Disintegrator" installed just below the screen. This crusher was put in to function as a reduction crusher and to produce a gravel having more desirable properties.

Excessive Breakage Kept Down By Controlling Feed

Feed into the crusher comprises certain size ranges coming off the screen. It is a 36-in. single cage crusher, driven at 450 r.p.m. by a 50-hp. motor. A low speed is considered desirable to hold down the production of fines and to prevent undue breakage of passable material.

The screen has 2¾-in. round hole perforated plate on the top deck, 1½-in. square mesh cloth on the intermediate deck and ½-in. square openings on the bottom. Overs from the top deck, up to 4-in. maximum size, and the ½- to 1½-in. product, enter the crusher. Gravel passing the top deck but retained on the second deck and the minus ½-in. material by-pass the "Disintegrator" to a 4- x 8-ft. Simplicity double-deck sizing screen.

Minus 2¾-in. plus 1½-in., which does not come in the size range subjected to the Los Angeles rattler test, is not crushed in order to help keep up the tonnage. The size range put under test is ½- to 1½-in. Another reason for by-passing a sizeable portion is that the production of unnecessary crushed particles would inevitably result in the formation of more edges on the gravel which are likely to break off under impact. Loss on the Los Angeles rattler would actually be higher by four or five percent if all material were crushed compared with the existing arrangement, according to experience at this plant. There is naturally some increased production of gravel chips and crusher "sand."

Sizing is done over two 4- x 8-ft. Simplicity double-deck vibrating screens, the first usually having 2⅞-in. round perforated plate on the top deck and 1⅜-in. sq. openings on the bottom deck. The other has ½-in. sq. and 3/16-in. sq. openings.

Beneath the screening plant are seven bins, each having 150 tons capacity. Six are for finished materials and the seventh is the raw material bin into which the plus 2⅞-in. gravel is dropped. The raw material is fed out when desired on to a belt conveyor feeding the cone crusher. Two of the bins are equipped for direct loading into trucks. A short horizontal shuttle belt conveyor above the bins is reversible and is the means of placing gravel from the sizing screens into bins on either side of the plant. Fines washed into a Telsmith sand drag for dewatering are then stockpiled by belt conveyor.

Vibrating Feeders Control Material Flow

Gravel from any of the six bins can be drawn to a common reclaiming belt conveyor which inclines upward and then extends horizontally over the stockpiling area. Any material in stockpiles can be returned to the plant over a tunnel belt conveyor. Four No. 4 Jeffrey-Traylor vibrating feeders regulate the flow of gravel from bins on to the stocking belt and a No. 5 pays out large gravel to be fed to the cone crusher. Capacity of the plant is 200 tons per hour.

The plant is equipped with a Los Angeles rattler testing machine, and grading analyses are made on a Gilson 6-tray mechanical testing screen.

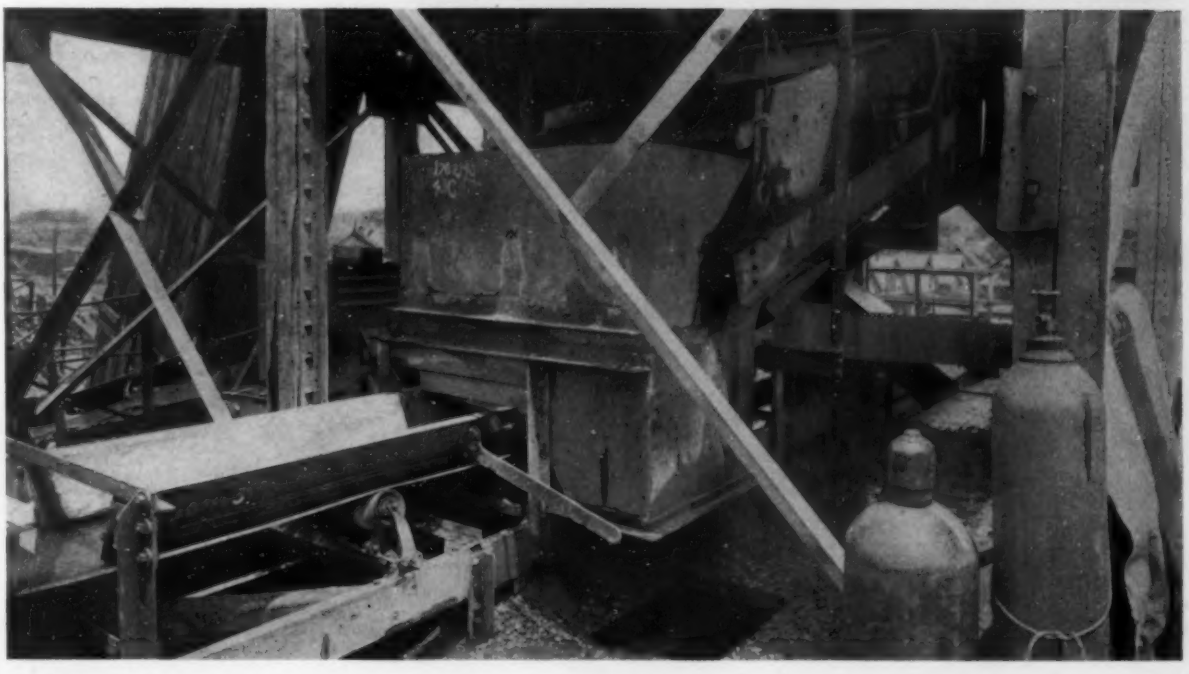
George Davison is president and general manager; B. W. Davison, vice-president; H. S. Davison, secretary-treasurer; and George H. Williamson, general superintendent. E. K. Davison is superintendent of the New Kensington plant.

One of the vibrating feeders which feeds out gravel from bins to reclaiming belt for stockpiling, loading into bins or into cars for shipment

Above: Fines, which are a product of crushing, are washed into a sand drag for dewatering and are then stockpiled on the long belt conveyor, to the right, at J. K. Davison and Bro. plant

Right: Impact type crusher, which was installed to serve as a reduction crusher and to produce crushed gravel of desirable shape

Below: One of the vibrating screens illustrates how the material may be discharged into the bin below or be transferred to another bin by belt conveyor



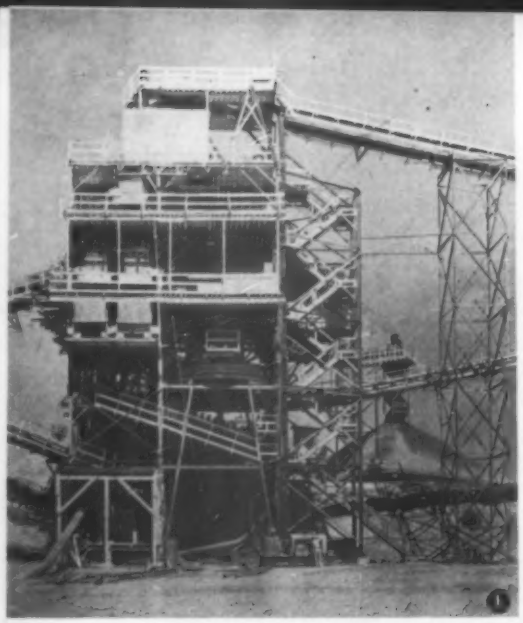


Fig. 1: Screening plant, showing surge bin, primary and secondary screens, riffles for recovering gold, hydro-separator cone, and screw classifiers

Long Field Conveyors Solve Transportation

Friant Dam aggregates plant to produce 600 tons per hour and recover gold as a by-product

By H. K. HERRICK*

NEARLY THREE MILES of conveyor belting and a crushing and screening plant with a capacity in excess of 600 tons per hour were required to supply aggregates for the big Friant dam now under construction near Fresno, Calif.

The design of the sand and gravel plant was largely governed by the size, shape and character of the gravel deposit, the number of sizes of aggregate to be produced, and the method of storage and shipment to the dam site. The deposit is a long narrow strip of land bordering the east bank of the San Joaquin River, about 2¾ miles downstream from the dam site.

Owing to the fact that the gravel plant would require considerable acreage, it was decided to lease enough land adjoining the deposit so that the stripping of the deposit and disposal of such waste would be more compact and the Government would not have to sustain a loss of 12 to 15 acres of the deposit which would otherwise be used for the plant site.

As soon as this decision was reached, definite design was started and submitted for the approval of the U. S. Government engineers in charge of the project.

A producing plant with a capacity of 600 tons per hour was wanted in about five months. This necessitated construction and design to progress at the same time. It was decided to use steel structures and fabricate a good portion on the job to insure speed.

Construction Features

The screening plant proper is a tower approximately 30- x 50-ft. in plan by 90 ft. high. This was fabricated, laid down in three distinct towers, and then raised with the use of an ordinary crane with about 50 ft. boom and a Caterpillar tractor. Towers for supporting belt conveyor trusses and stringers were also fabricated on the ground and set up with a crane.

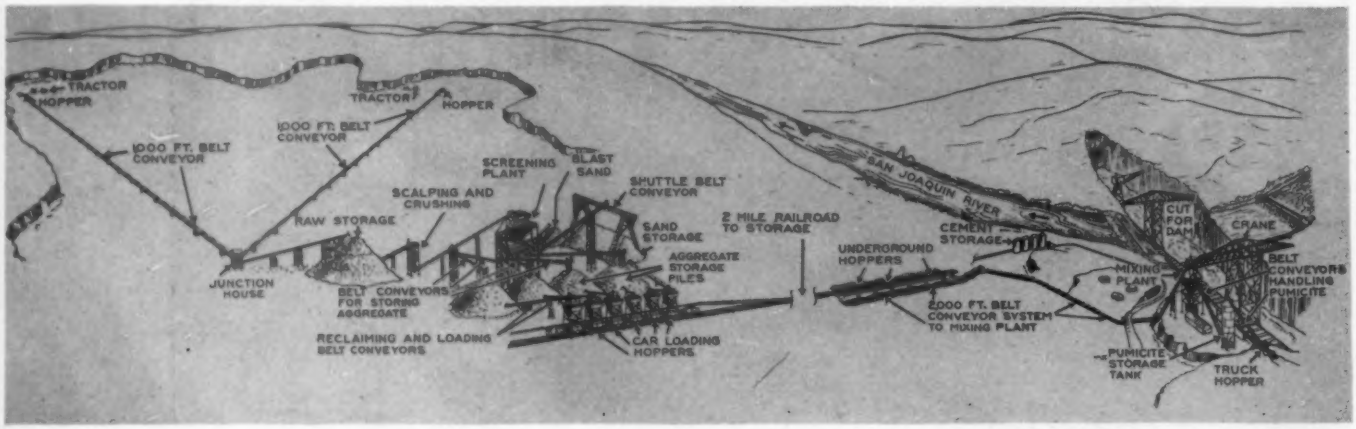
The structure over the sand storage consists of two arches about 60 ft. high with cantilever ends. These arches are connected with a truss. Each arch and overhanging end was fabricated on the ground and lifted up to a vertical position with a crane. Then the central truss was hoisted with four tractors. The time required for this erection amounted to a very few hours.

Conveyor stringers were purchased fabricated in 30-ft. and 40-ft. lengths, consisting mostly of 10-in. and 12-in. channel laced together with warren style lateral bracing. There was approximately 200 tons of this material. The stringers were placed on top of the towers and bents, in sections approximately 60 ft. and 80 ft. at a time, either pulled up over the carriers from the bottom where the conveyor was too high for a crane or lifted directly in place with a crane. A tractor with hoist and gin pole, mounted on it, was a most useful piece of erection equipment.

Large Storage Area

Placing the machinery for the conveyors, feeders and screens went on simultaneously. Carpenters constructing the walk way and platforms; welders making chutes and special frames; and riggers, plumbers, electricians, mechanics and common laborers worked together under the direction of General Superintendent M. H. Slocum and Frank Bachman, superintendent of construction of the gravel plant. The operation of the plant is briefly as follows.

* Engineer, Stephens-Adamson Manufacturing Co., Los Angeles, Calif.



Perspective view flow sheet of the Friant Dam aggregates plant showing the method of conveying materials to the concrete mixing plant

and Tractors Problem

The stripped area of aggregate deposit covers between 50 and 60 acres, about three times as long as it is wide. In this area are two receiving hoppers 16- x 20-ft. in plan and about 10 ft. deep, with longitudinal grizzley bars of sufficient strength and spacing that a tractor and carryall can drive over and dump without stopping. Under these hoppers is a double reciprocating plate feeder at right angles to a 36-in. belt conveyor. Each of these two conveyors is about 1000 ft. long and they converge at the center edge of the deposit, and discharge onto an inclined 42-in. belt conveyor. The latter conveyor raises about 70 ft. and the material discharged forms a large raw storage pile.

Under this raw storage is another double plate feeder driven with a 20-hp. motor through an Allis-Chalmers Texrope variable speed drive. This speed changer is controlled from the screening plant and the load can be varied at the operator's requirements.

The 36-in. belt conveyor fed by the above mentioned feeder carries material to a 5- x 10-ft. Stephens-Adamson scalping vibrating screen passing all minus 6-in. material, the oversize going to a No. 5 Austin crusher. Only about ½ of one percent of the material is over 6 in. After passing the scalping screen the material is carried to the top of the screening plant on a 36-in. conveyor and discharged into a bin approximately 20 ft. square and 10 ft. deep.

Under the head pulley is a swinging arm attached to a push button switch. If the bin becomes dangerously full the limit switch operates and stops the feed to the bin.

Views of aggregates plant. Fig. 2: At left, main 36-in. conveyor to plant coming from scalper and crusher; center, double reciprocating feeder under storage pile; and to the right, 42-in. field conveyor to raw storage fed by two 36-in. field conveyors. Fig. 3: Screening plant with main feed conveyor above and pea gravel conveyor coming through between supports. Fig. 4: Sand storage, showing conveyor from plant and shuttle conveyor over storage under which are located 24 hinged sand gates. Fig. 5: To the left is the screening plant, and to the right, rock loaders leading from stockpiles to carloading bins. Stone ladders to the left prevent breakage

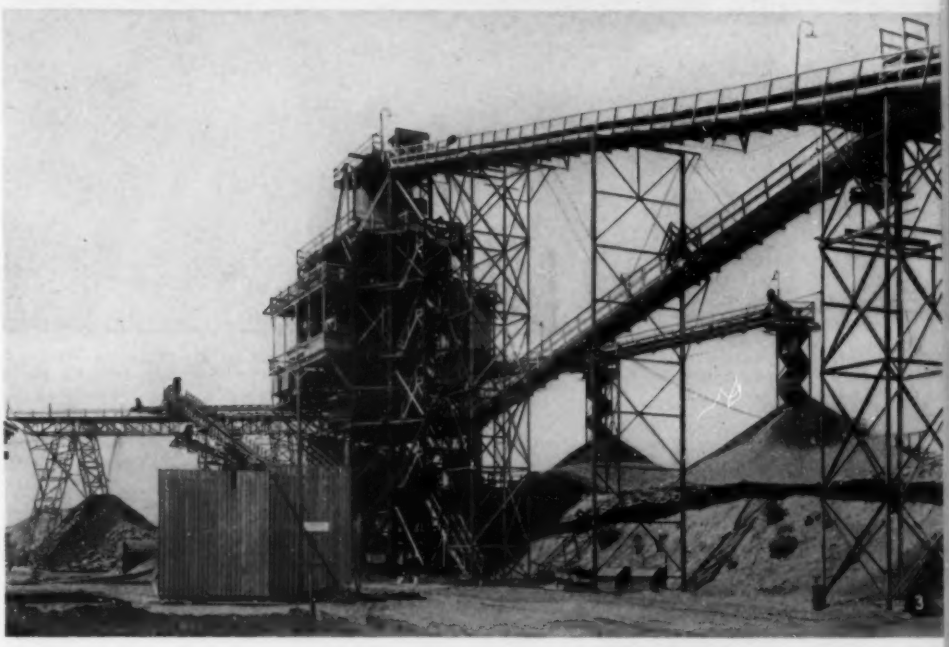


Fig. 6: Mixing plant with aggregate conveyor shown to the extreme left and pumicite conveyor to the right enclosed in steel shell cover. Surge tank to the right holds a supply of pumicite

Under the bin are three single plate feeders with adjustable cranks which feed three primary 4- x 12-ft. Stephens-Adamson double-deck vibrating sizing screens. The two sizes produced here go on to two transverse 24-in. belt conveyors which carry the finished material to their respective rock ladders. The through material and water are flumed to six 4- x 12-ft. Stephens-Adamson triple-deck vibrating screens. These screens produce the fine grades of gravel as well as blast sand. This finished material is likewise discharged on to 24-in. belts that carry to the respective rock ladders in storage piles.

The sand and water now passes over riffles and then to a circular settling tank 20 ft. in diameter having revolving blades. Here most of the water and silt overflows over a weir around the periphery of the tank and goes to waste flume. The bottom of the tank is fitted with a "stocking" valve which regulates the flow of water and sand to the classifiers. There are four 60-in. diameter by 26-ft. long inclined screw classifiers; two with double flights and two with single flights. The feed to the different screws is so arranged that two or three grades of sand can be produced. The double flight or primary screws produce about 70 percent of the sand having 19 to 20 percent moisture content. The tailings of these screws are flumed to the secondary screws which produce the remainder of the sand which is 40 to 100-mesh screen size. This sand contains nearly 30 percent moisture though it looks as dry as the coarser sand. Each set of classifiers discharges into sand hoppers of about 7-cu. yd. capacity. At the bottom of each of these hoppers is a 30-in. Hardinge constant weight feeder. This permits accurate blending of sand. If either grade of sand is overproduced it spills out over the filled hopper into the flume. The sand from the scales is discharged on to a 30-in. inclined belt which discharges on to a 30-in. horizontal shuttle conveyor over the storage pile.

All rock and sand is reclaimed with belt conveyors. Wooden tunnels were constructed of short ready cut pieces of plank to make a strong laminated continuous arch. The reclaiming conveyors each discharge into a hopper set over a rail track spaced to be exactly a car length apart. A train of six cars of 50-ton capacity each is loaded by hinged chutes electrically operated; time required to load hopper is about 10 minutes, time to load train is about 40 seconds. The round trip time of train is 25 to 30 minutes.

Trains are pulled with G.E. Diesel-electric locomotives to receiving hopper at the dam site at Friant. Feeders, conveyors, screws, chutes and gates with transmission machinery were made by the Stephens-Adamson Manufacturing Co., Los Angeles, Calif. The sand classifiers were manufactured by the Western Machinery Company and, as previously mentioned, the scales for proportioning sand were furnished by The Hardinge Co., Inc. Motors were mostly General Electric make and were mounted on Saco speed reducers. Belts of the latest cord design were made by the B. F. Goodrich Co.

The design and construction of the Friant dam is being carried on by the Bureau of Reclamation. Walker R. Young is supervising engineer of the Central Valley project and R. B. Williams is construction engineer in charge of Friant Dam. A. S. Hartley is in charge of the field office of the Bureau at the aggregate plant.

Griffith Company and Bent Company, general contractors, are constructing the dam under the direction of H. Stanley Bent as project manager. H. M. Slocum is general superintendent. P. O. Hayes is in charge of the operation of the plant. Plant design and supervision was by the Stephens - Adamson Manufacturing Co. engineers.

Fig. 7: Part of 36-in. conveyor system. It is 2000 ft. long from track storage to mixing plant in the background

Sampling Clinker and Cement

To meet the New York State specifications

By NATHAN C. ROCKWOOD
and BROR NORDBERG

Automatic sampler for cement used by Keystone Portland Cement Co. Left end of horizontal rod carries ladle across stream inside hopper chute as it falls from screw conveyor into cement pump

CEMENT PLANTS in the East, making cement under the New York State Department of Public Works specifications, have a special problem in sampling. These specifications call for the Paul autoclave soundness test *on clinker*. The clinker under this test must satisfy the purchaser before he will accept the cement made of it. So, since last January, the mills making this cement have been required to install "approved" automatic clinker samplers. The following data in connection with samplers was gathered on a recent visit to plants in the Lehigh Valley.

A 10-lb. sample of clinker, free from gypsum, must be taken from each 300 bbl. of clinker as it is being conveyed or fed into the grinding equipment. Samples must be taken continuously and be placed directly in sealed boxes which can be opened only by the state inspector.

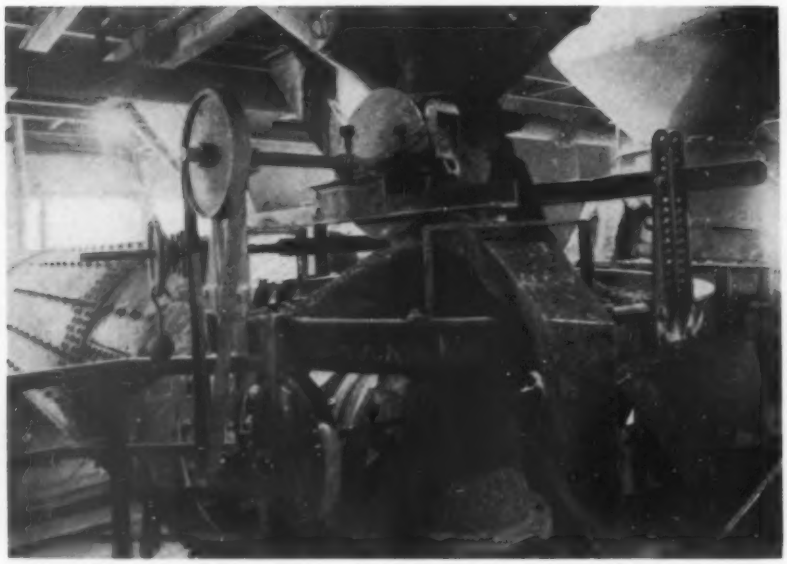
Getting a representative sample of clinker is much more difficult than getting a representative sample of cement or raw material, because segregation is a serious factor and one that must be taken into account to the satisfaction of the inspector in the adoption of any method of sampling. The method of sampling adopted cannot be the adaptation of any standardized equipment since practically all the plants differ at least in some regard in handling procedure, types of conveying equipment used and plant limitations. Some of the plants handle clinker and gypsum separately into grinding mills, while others do so simultaneously, but the sample must be taken, irrespective of feeding mechanism, of the clinker without added gypsum.

A considerable volume of portland cement falls under this specification, requiring the holding of cement in silos, so it is of utmost importance that sampling be done by a dependable, fool-proof method, to insure that a silo of cement be tested and accepted. Several types of samplers are described and illustrated herewith.

THE KEYSTONE PORTLAND CEMENT Co., Bath, Penn., has positive control electrically of its sampler, which is used on each of four compartment mills. The mills are fed clinker from bins over table feeders, gypsum being handled on separate table feeders. A centralized electrical control box regulates the operation of each sampler.

The sampling is done by catching a small amount of clinker in a ladle, or spoon, at the point where the table knife drops the clinker into a chute to the mill. The ladle is on one end of a 1-in. horizontal rod which is connected through a crosshead and connecting rod to a crank pin on the face of a 14-in. diameter vertical disc, that, when driven, produces a horizontal reciprocating movement of 12 in. on the rod and therefore the ladle. A 1/6-hp. constant speed synchronous motor drives the sampler (the discs) through a gear reducer followed by a chain drive. The horizontal rod, near the ladle end, slides in a sleeve which has a cam, or groove, which a pin on the rod must follow as the ladle returns to its original position. By so doing, the rod revolves slowly and

Taking clinker sample from table feeder discharge for New York State autoclave test. Horizontal rod under table feeder, left foreground, has a travel equal to diameter of disc to which it is pinned. Motor driving disc is started automatically by control box and rod touches limit switch to the right at the end of stroke to stop motor. Left end of rod has ladle attached which empties into locked box



Continuous automatic sampler used on clinker for New York clinker autoclave test by National Portland Cement Co. Disc to which bucket is attached is belt driven to scoop up clinker at regular intervals from table feeder. Bucket drops clinker into flared pipe which fills sample box

empties clinker from the ladle into a spout that fills the locked sample box on the floor below.

In operation, the ladle emerges from under the table feeder, cuts all the way across the stream of clinker in the chute and returns under the table to drop its contents into the spout. Directly over where the ladle cuts into the clinker stream, a V-shaped baffle plate slows the velocity of the falling clinker. Rate of speed of the ladle is important and is governed by the reduction ratio and stroke of the drive. Three passes through the stream produce one pound of sample, at a speed comparable to a hand sample that would be timed for best results.

For accuracy, it is considered desirable that the ladle not fill up completely, since the overflow would be mainly of the larger pieces, because of segregation in the ladle. The sample then would lean toward the fine and not be representative.

Timing of the sampling is done automatically in the electrical control box by means of a slowly turning disc having contact points on its circumference and necessary relays. The disc is driven by a motor and turns a revolution in 24 minutes. As the several contacts are made, the sampler motor is started and samples are taken simultaneously at the four mill feeders. In other words, this is the means of timing the frequency of sampling which is at ten minute intervals. At the return stroke of the ladle rod, a limit switch stops the motor. A lamp flashes at the control box to indicate that samples are taken.

This sampler has been very satisfactory and is also used to sample the cement. Cement is conveyed from the grinding mills by screw conveyor and the ladle takes its sample from the chute through which the cement drops into a Fuller-Kinyon pumping system. In this way a cross-sectional sample is taken, just as in the case of clinker and spouted into a locked sample box.

Incidentally, New York State requires the use of an approved automatic device for sampling cement as well as clinker. It is specified that cement be sampled just prior to its entering the storage silos and that fair hourly samples be taken and delivered into locked containers.

THE NATIONAL PORTLAND CEMENT Co., Brodhead, Penn., has about the same condition, in that gypsum and clinker are fed separately into grinding mills over table feeders, but has an entirely different sampling device. A small ladle, or bucket, holding about a half dozen pieces of clinker, is fastened rigidly to a 12-in. diameter wheel. The wheel is turned in a vertical plane on a shaft, which is driven by a system of pulleys, as illustrated, off the table feeder drive shaft. The wheel is located just above the table so that it scoops up clinker as it spreads over the table from the overhead bin spout. The location of the wheel is such as to get an average cross-sectional size of clinker, and in operation it looks like a small ferris wheel. Pulley diameters govern the speed of the sampling wheel. The ladle discharges on the downward travel into a funnelled 3-in. pipe that empties into a one cubic foot locked box.

THE GIANT PORTLAND CEMENT Co., Egypt, Penn., has its clinker sampler located as close as possible to the withdrawal point from clinker storage. Breakage was a factor in earlier attempts to sample at the preliminary grinding mills, due to considerable handling by drag conveyors and elevators. The sampler consists of a chain and bucket mounted on a frame-work of angle iron straddling the drag chain conveyor.

Travel of the chain is in an almost vertical direction, the bucket dipping down into the clinker stream to catch a sample. The chain is driven by a ¼-hp. constant speed motor through a gear reducer and chain-sprocket drive. The bucket holds two pounds of clinker taken from a bed 8 to 9 inches deep, and discharges into an

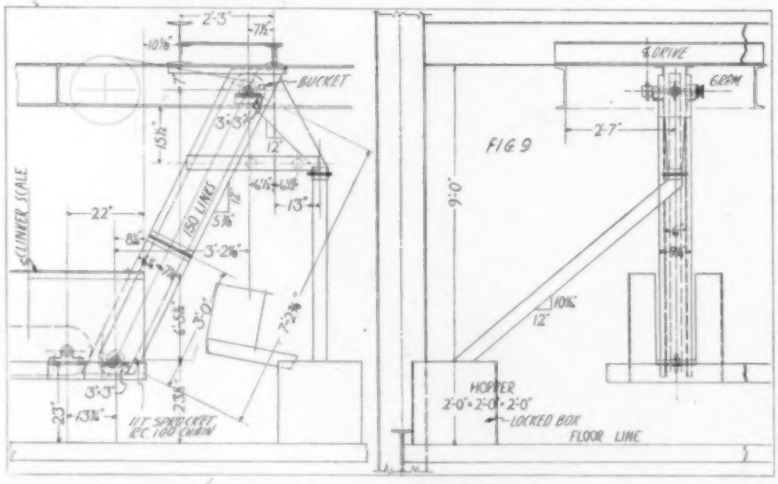


Fig. 9: At Nazareth Cement Co., scales proportion clinker and gypsum into grinding mills. Sampling is done by passing buckets attached to a chain and sprocket system through the clinker stream at the point of discharge from the scale. Buckets dump into hopper connected to spout filling container

open top drum of 500 lb. capacity just below the point of discharge. The shafts on the sampler elevator are fastened into slots on the angle-iron framework so that the digging depth may be varied. The plane of operation is not directly over the center line of the drag conveyor, but off-center, near the quarter point, in order to get more nearly a representative size in the samples. If mounted directly over the center-line of the drag, the sample would be largely of fines. Samples are taken every three minutes by the bucket. The container is open-top in this sampler, but the entire sampler including the container is to be enclosed by wire mesh and locked as required. This method permits actually seeing the taking of the sample.

Cement, in this plant, is conveyed by screw conveyor, followed by an enclosed bucket elevator into storage. A continuous cement sampler is operated off the screw conveyor at just about the last place a sample could be taken before storage. A short 3-in. diameter screw conveyor is constantly taking a stream of cement out of the main screw conveyor and samples are tapped from this diverted stream. The small screw housing is welded just below the main conveyor, cross-wise, and has no top so that cement is constantly going into the small cross conveyor. This sampling conveyor is driven by sprocket and chain off the main conveyor drive and constantly discharges into the cement bucket elevator.

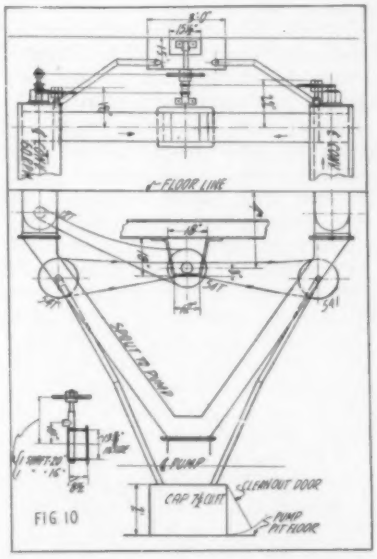
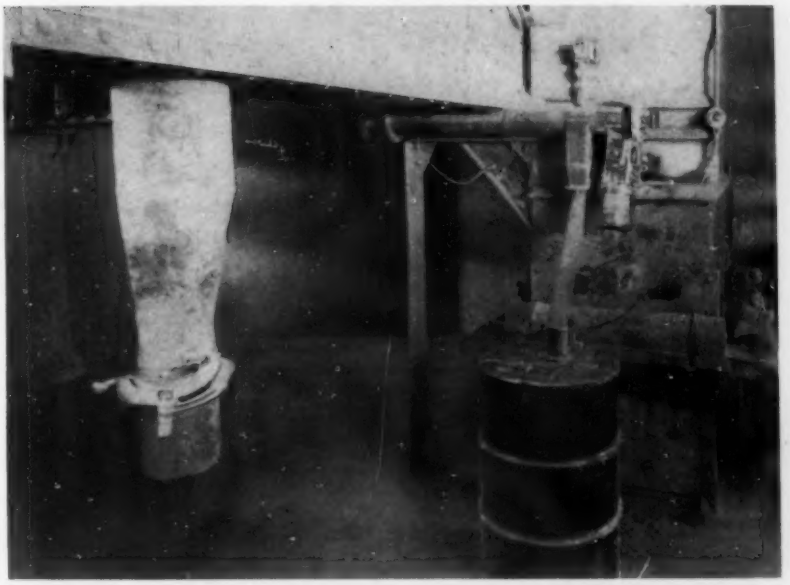


Fig. 10: Automatic continuous samplers are also used by Nazareth Cement Co. for cement. They consist of a small screw conveyor at right angles to the direction of the cement stream going from the main conveyors to the cement pump, with the sample taken by screw conveyor dropping into a container



To secure cement samples, Giant Portland Cement Co. employs a short screw conveyor which cuts across main screw conveyor to elevator. The time clock electrically throws gate to allow some cement to drop at regular intervals into locked box. Note flash bulb on right and tin can used to catch ordinary cement samples

A time clock is set to permit dropping a sample from the short conveyor housing through a spout into a

Another type of continuous sampler for clinker used by Giant Portland Cement Co. in taking samples for the New York test. Bucket scoops up clinker at regular intervals as it comes from storage by means of a small drag chain conveyor, the samples dropping into the drum. When completed the entire framework and mechanism will be enclosed and locked

locked container by actuating a small slide gate. This is done every three minutes for a half minute interval. A trap door at the cement container completes a contact and a bulb flashes, indicating that cement is flowing into the receptacle. Also, by a manual operation, a regular sample can be taken with the can as shown in the illustration.

THE NAZARETH CEMENT CO., Nazareth, Penn., uses Richardson scales to proportion clinker and gypsum into the grinding mills. Sampling is done by passing buckets attached to a chain and sprocket system, as illustrated in the accompanying drawing (Fig. 9), through the clinker stream at the point of discharge from the scale. The bucket dumps into a hopper which is connected to the spout filling the container.

Nazareth also uses automatic continuous samplers on cement. The second drawing (Fig. 10) shows details of the sampler used when air separators are in the grinding circuit for grinding high surface cements. It consists, as shown, of a small screw conveyor at right angles to the direction of the cement stream going from the main conveyors to the Fuller-Kenyon cement pump, with the sample dropping into a container.

THE LAWRENCE PORTLAND CEMENT CO., Siegfried, Penn., has a similar clinker handling method, using Richardson scales and a somewhat similar idea for sampling is used. However, the bucket-chain system is driven by a variable speed motor.

These few samplers serve to illustrate the extremes which were necessary to satisfy requirements and to insure the cement manufacturer that he is getting a fair sample and continuously. Needless to say, many methods and devices were tried in some cases before arriving at a satisfactory solution.

Subsequent discussion will describe the routine plant practice in other parts of the country.

"Talk Shop" At Safety Congress

Practical applications of safety procedure and equipment in quarries and mills brought out in panel discussions

AN EXCELLENT attendance of cement and quarry officials greeted Chairman P. N. Bushnell at the first meeting of the section at the National Safety Congress, October 9, in the Stevens Hotel, Chicago.

Something entirely new was tried this year to bring out more active participation of everyone in a discussion of the more practical phases of safety—the Panel Discussion. Chairman H. F. Yotter and his Program Committee did an excellent job in lining up the discussion leader.

New Officers

Most of the officials of the Cement and Quarry section, National Safety Council, were continued in office. Chairman Bushnell could not be prevailed upon to accept office for another year as the press of duties with his company did not permit him to continue to serve. The official slate of officers presented by Col. Reninger follows:

General Chairman, R. A. Dittmar, Universal Atlas Cement Co., Hudson, N. Y.; Vice Chairmen, O. M. Graves, The General Crushed Stone Co., Easton, Penn., and W. M. Powell, Medusa Portland Cement Co., Cleveland, Ohio; Secretary, A. J. R. Curtis, Portland Cement Association, Chicago, Ill.; News Letter Editor, Jack Dempster, Canada Cement Co., Ltd., Montreal, P. Q., Canada.

Committee chairmen include: Engineering, Th. Avnsoe, Lone Star Cement Corp., New York City; Membership, H. A. Reninger, Lehigh Portland Cement Co., Allentown, Penn.; Program, H. F. Yotter, The General Crushed Stone Co., Easton, Penn.; Publicity, David Adam, Lawrence Portland Cement Co., Northampton, Penn.; Statistics, W. W. Adams, U. S. Bureau of Mines, Washington, D. C.

Members at Large on Executive Committee: W. H. Baker, J. E. Baker Co.; E. D. Barry, Universal Atlas Cement Co.; J. R. Boyd, National Crushed Stone Assn.; P. N. Bushnell, Missouri Portland Cement Co.; R. B. Fortuin, Pennsylvania-Dixie Cement Corp.; F. B. Hunt, Dewey Portland Cement Co.; S. W. Stauffer, National Lime Assn.; L. P. Warner, Jr., Warner Co.; A. L. Worthen, The New Haven Trap Rock Co., and J. B. Zook, Great Lakes Portland Cement Co.

Analysis of Cement and Quarry Accident Experience

IVAN F. LE GORE, safety engineer, Portland Cement Association, gave a very complete analysis of accident experience in which he introduced a note of warning that the national defense program will inevitably affect

R. A. Dittmar, new chairman of the National Safety Council's Cement and Quarry Section

safety work. More labor turnover will make necessary an intensive training program, and expanding production will introduce more hazards as older equipment is placed in operation.

As evidence that the increased business activity and distractions of war have had an unfavorable effect on the accident situation, Mr. Le Gore pointed out that during the first seven months of 1940 all accidental deaths in the United States had increased 7 percent over the same period last year. Home deaths had increased 8 percent, traffic deaths 5 percent, and occupational deaths advanced 14 percent.

Comparing the present war with the world war of 1914-1918, Mr. Le Gore said that the present demands were for dry docks, wharves, airports, bombproof shelters, storehouses, etc., which will eventually tax the capacity of cement mills and quarries. Safety organizations, however, are better able to meet the problem of additional hazards through more adequate safety equipment and training procedure.

Although 1939 was the safest in the 27-year history of accident prevention in the cement industry with only 4.25 men injured per million man-hours worked, the 1940 story is not so gratifying. In the first eight months of this year, 130 portland cement plants reported exactly the same number of accidents as 125 reported during the same period last year. The accident total was down 10 percent to the end of June, with production up 5 percent and shipments off 1 percent. Then in two months, July and August, the gain was wiped out—and production increases were not responsible. Including September, there were 8 fatalities in 1940 as compared with 6 deaths all last year. Concentration in accident prevention will be continued on the four most dangerous spots—High Places, Moving Machinery, Electricity, and Haulage.

As data for both the National Lime Association and the National Crushed Stone Association are compiled annually, no figures are available for 1940. In 1939, 41 plants in the lime industry produced an injury frequency of 25.1 and a severity of 3.5. Fifteen lime plants completed the year without a single injury.

Quarries, mines and clay fields have contributed to the total in the cement industry a smaller proportion of injuries than last year, although they continue to hold the top position. Two fatalities have been reported by quarries as compared with one a year ago. Increases in percentages of total injuries in both crushing and raw operations have brought the proportions for the entire raw side to 41 percent of the total. Storage, packing, and shipping represent 13 percent of the total. Together, Raw and Shipping have contributed 54 percent of the total accidents while working less than 40 percent of the total man-hours. More than 18 percent of the men injured during the first eight months in 1940 had less than six

months' service, and one-third of all injured had been doing the work on which they were injured less than six months.

Keen interest was exhibited in the first panel discussion on the subject of Physical Control of Accident Hazards. Joe Lewis, assistant superintendent of accident prevention, Universal Atlas Cement Co., was discussion leader.

Physical Control of Hazards

FRED B. HUNT, Dewey Portland Cement Co., led off on the subject of proper design of plants and equipment. To safeguard workmen, an audible signal is used by one company on the starting switch of an elevator. Locked switches are preferred to tagged switches to indicate men are working on equipment shut down. Considerable discussion involved the location of safety switch handles. One suggested that the handle should be on the left hand side to eliminate the possibility of accidents should there be a blinding flash due to overloading or short circuit. Another company is now using air circuit breakers exclusively in place of safety switches.

A. A. OESTERLE, Federal Portland Cement Co., Buffalo, N. Y., led in the discussion of inspection methods. Some companies use check lists for inspections, but it was also suggested that this method may not detect some dangerous condition that was not included on the list. Monthly inspections are usually made by all companies of chain falls, blocks, cables, slings, etc., whether or not they may have been used. Daily inspections also are made of equipment in use.

T. W. JONES, New Haven Trap Rock Co., called for a discussion of guards. This subject did not bring out much discussion as those present were fully in agreement on the great value of adequate guards for all equipment needing them. Even so-called safety couplings should be guarded.

H. R. PATTERSON, Lehigh Portland Cement Co., started the discussion of personal protection; such as, lifelines, respirators, belts, safety shoes, goggles, etc. Goggles which fit over glasses are to be preferred as they do not offer any excuse to wearers of glasses not to use goggles. Certain "must" uses for goggles and other equipment, such as respirators, are prescribed by some plants. One company furnished safety shoes and respirators to all its employes, regardless of whether their work required it. All safety equipment must be turned in when the plant is shut down, and it is then carefully inspected, repaired and cleaned before it is reissued. Hydrochloric acid solutions are used to clean the glass of goggles of any cement incrustation.

Dr. Sayers Is Luncheon Guest

DR. R. R. SAYERS, Director, U. S. Bureau of Mines, was the honored guest at the luncheon preceding the concluding session on October 10. He complimented the Cement and Quarry Section for the excellent safety record of their respective industries, and described the activity of the Bureau in the defense program to fortify the needs of this country for certain strategic minerals. Jack Dempster of the Canada Cement Co., Ltd., Montreal, gave an inspiring message of encouragement on the present world situation and the part safety men may play in it.

Creating a Safe Working Force

The new chairman, R. A. Dittmar, presided at the closing session and introduced the panel discussion leader and his participants.

R. A. BECHTOLD, Pennsylvania-Dixie Cement Corp., discussion leader, called upon John Kelly, Marquette Cement Manufacturing Co., to tell about his company's methods of selecting men. Mr. Kelly said that all men are employed through a central employment bureau, and then are thoroughly examined by the medical department. After the medical examination, the new employe is taken to the safety engineer and then to the department foreman. A very important discussion developed over the question of physical standards for employment, and the methods employed in the case of old employes becoming disabled so that they are unable to continue in hazardous work. L. P. Warner, Jr., of The Warner Co., said his company has been able to find easy, non-hazardous work for these employes but recognized that it may become increasingly difficult to fit these employes into jobs of this kind. C. P. Harris of Huron Portland Cement Co., said his company has a pension plan, but these disabling cases are not being taken care of by the pension system. It was suggested that it may be possible to secure waivers from State authorities for liability in employing men with organic troubles.

L. P. WARNER, JR., led in the discussion of analysis of Work Methods and Operating Practices. Several companies had started these analyses as a method of establishing wage rates but these studies had been developed to include job hazards. Mr. Warner told about his company's experience in training men to meet an increase in production, necessitating a night shift. In anticipation of this expansion, the company employed more men than necessary on the day shift to train workmen for the night shift. He said their experience showed that employes safety suggestions were very valuable. Each job in his company's operations is studied to determine its accident hazards. Mr. Dittmar of Universal Atlas Cement Co., reported that his company had found job analysis valuable in determining whether new methods or equipment could make jobs safer. He said that it was vitally essential that the management have a real interest in safety if this work is to progress. Mr. Greer of Marquette Cement Manufacturing Co., expressed the opinion that job analyses should be made solely in the interests of safety rather than for determination of wage scales.

C. P. HARRIS of Huron Portland Cement Co., said his company's training program operated mainly through foremen's meetings. Voluntary meetings among the men to discuss safety practices and suggestions are encouraged by another company. Mr. Greer said that he was following the Safety Conference procedure of the P.C.A. His company uses a mimeographed card of instructions for each job which is given a new employe or one who has been transferred. The foreman also shows the employe how to do the job, and then fills out the card indicating the man has been properly instructed. Both employe and foreman sign the card.

ALEXANDER HETHERINGTON, Universal Atlas Cement Co., pinch-hitting for Mr. Avnsoe of Lone Star Cement Corp., who could not be present, led in the discussion on Instructing Foremen to Be Teachers. He spoke highly of the P.C.A. foreman conference training course. It has been proved that foremen who know their jobs may not be teachers. One company had called in the Bureau of Mines to give its safety course, and this training had revealed whether the foreman could also teach. Opinion was divided as to whether safety meetings could be held on company time. Those who held safety meetings of foremen on company time had found no difficulties arising from this practice. Those companies holding safety meetings outside of working hours usually provide dinners and a social program following the business meeting.

CHAIRMAN R. A. DITTMAR, in closing the meeting, expressed the hope that everyone present would return to the meetings in 1941 to be held in Chicago and that they would give Program Committee Chairman H. F. Yotter full coöperation in suggesting topics for next year's convention.

Specification Essentials

ARTICLE NINETEEN

On sizing, testing and specifying aggregates points to the need for clearness, fairness, and definiteness in specifications

By ELWOOD T. NETTLETON*

THE PRODUCER of aggregates seldom or never writes the specifications for the product he makes. Too frequently he has little to say directly, nor is he often consulted individually by the purchaser as to what the specifications should be. Through his national and state associations he can collectively exert considerable influence in many cases, but individually he has little influence.

One good reason for this is that the producer often is not any too familiar with the theories back of specification writing; and too often he is not well enough informed through tests on his own product to know what sizes are most economical, either to produce, or to give the best results on the job.

With these points in mind I am submitting some suggestions in the form of recommended changes in specification writing, not so much with the expectation that engineers and public officials will accept them, as to forearm producers with points they might well use in arguing about specifications, if they have to.

Clearness, Fairness and Definiteness

Engineers, public officials, and architects should be held responsible for recommending the best materials consistent with economy. Specifications should be so drawn that they specify exactly what is wanted. Naturally, if any choice is given the contractor in buying materials, he will, for necessary financial reasons, choose the cheapest. Consequently, specifications for aggregates should clearly state those specific qualities which the material must have in order to prove its suitability for a particular use. Furthermore, these specifications should either define the exact test methods to be employed or else give reference to certain standard approved tests.

Often specifications have to be interpreted by unlettered persons who are in no position to know the reason or the importance of any particular requirement as specified. Consequently, the specifications should be so clearly stated in writing that no one could possibly misinterpret the meaning as a basis for an argument.

The specification should be fair and should omit, wherever possible, the use of such indefinite words and phrases as: about, acceptable to the engineer, or approved by the owner. Indefinite clauses are earmarks of an engineer who in writing specifications lacks ability to express his thoughts properly, or else he lacks proper knowledge of tolerances, tests, etc., to describe what he desires. Therefore, to cover up his deficiency, he puts in indefinite phrases to meet any emergency. This places the contractor or producer at the mercy of this particular engineer, or of some inspector with less knowledge. The specifications should be a guide, not a club.

There are words, such as, seam-faced, discolored, elongated, weathered, and decomposed which need to be defined:

Seam-faced or discolored — Rock discolored on surface only but otherwise sound.

Weathered or decomposed — Rock whose physical or chemical structure has been altered from its original state by action of weather.

Elongated—Pieces whose length exceed five times its least dimension.

Sound—By sound is meant rock which meets the tests for soundness as required by the following test (—list test and limits.)

Such phrases as "not over 10 percent" should be explained as meaning "not over 10 percent"—by weight, volume, or number of pieces.

If properly written only that which should be enforced should be in the specifications. The specification should include only that which is economically and practically obtainable in the field or on the job.

The first indication of fairness on the part of any engineer comes when he prepares the specifications.

National Standardization of Methods for Routine Testing

There is absolutely no reason why routine tests on aggregates could not and should not be standardized for the whole country:

(1) It would give very valuable comparative data.

(2) It would simplify testing practice.

(3) It would keep down the investment in testing apparatus.

Considerable standardization of this nature has been accomplished by the American Society for Testing Materials, American Association of State Highway Officials, American Concrete Institute, American Standards Association, and many others. There is no reason why these and other similar bodies, by conference, could not eventually arrive at a standard set of specifications for routine methods of testing.

Regarding this subject, it should be clearly understood that the writer advocates national standardization of methods of routine testing, but *not* national standardization of limits, tolerances, or results required in passing these routine tests.

Regional Variation in Limits

This question then arises: If specifications refer to national standard tests and national standard methods of running the tests, why not have the specifications also require the same limits, tolerances, and results in these tests when the aggregate is to be used for the same purpose?

It would be foolish to make test limits on crushed stone so rigid in Illinois, that only trap rock could be used, since this material is not available within economical shipping distance of the state. It would be just as foolish to make test limits on crushed stone so low in Connecticut that local disinegrated "bastard" granite could meet the physical and chemical tests. In Connecticut, this latter stone would

(Continued on page 50)

* General Superintendent, L. Suzio Construction Co., L. Suzio Trap Rock Co., The Suzio Trap Rock Co., and the York Hill Trap Quarry Co., Meriden, Conn.

LIME INDUSTRY BUILDING NEW PLANTS

By VICTOR J. AZBE

ON THIS PAGE we often refer to the rapid progress of the lime industry today, ordinarily without becoming specific. This is because we are often requested to withhold information, which requests we must honor regardless of our beliefs. To withhold information on secret specially developed processes is entirely logical, but to do that in the case of general engineering is not. We find that the

LIME FORUM

more liberal one is with information the more information becomes available to him, then subsequently as to who comes out on top is altogether a matter of adaptiveness and initiative.

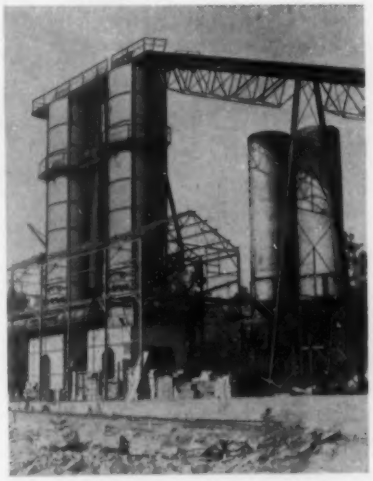
But at times heads of concerns take a more liberal view and reveal it all with possibly only a few reservations. One of these is the Gypsum Lime and Alabastine Co. of Canada, Ltd., whose lime plant at Beachville, Ont., was fully described in these pages. Since then this plant, under the direction of J. H. Robinson, general superintendent, has performed splendidly. One of their over 60-ton a day capacity kilns has been producing lime for over a year, and natural gas consumption has been reduced to 4500 cu. ft. per ton of lime averaged for the entire month in spite of week-end shut-downs. This, we believe, is a record for high calcium lime kilns. The plant as a whole turns lime out more economically than any and is beating the standard set by the last National Lime Association convention paper, entitled "Plant Design for Economical Production of Lime," which was published serially in the Forum.

However, in Ontario pressure is dropping at the gas wells and advantageous as natural gas has proved, the plant will have to be converted to producer gas. The change is now going on; a modern automatic gas producer is being installed and in addition one more 70-ton lime kiln is being built. After these are placed in operation, very early next year, some interesting information will be forthcoming contrasting producer with natural gas performance that will prove of value to the industry.

Increased Production With New Plants

Work of even greater import is now going on at Lewisburg, Ohio, where the Marble Cliff Quarries Co. is building a new lime plant. Lime plant projects ordinarily are additions or conversions. It is seldom indeed that a new plant is built from scratch. Those of Marble Cliff Co. most concerned with this project include Russell Rarey, who is well known in the industry; R. H. Pausch, who has charge of engineering, and R. W. Bowen, production manager, in direct contact with construction.

As in the case of the Canadian concern, Marble Cliff also is agreeable to have published in ROCK PRODUCTS a full account of the arrangement and operating results when the



Lewisburg, Ohio, lime plant of Marble Cliff Quarries Co. under construction

proper time arrives. Unfortunately, for several reasons, particularly due to a slow up in steel shipments on account of the war, the completion of the plant is delayed.

The approach to the design and construction of this entirely modern plant was most careful. Nothing was left undone to have it right. The whole moved through a series of studies. At the very first, the flow sheet shown herewith, was drawn, which through steps was elaborated upon to final drawings and later construction.

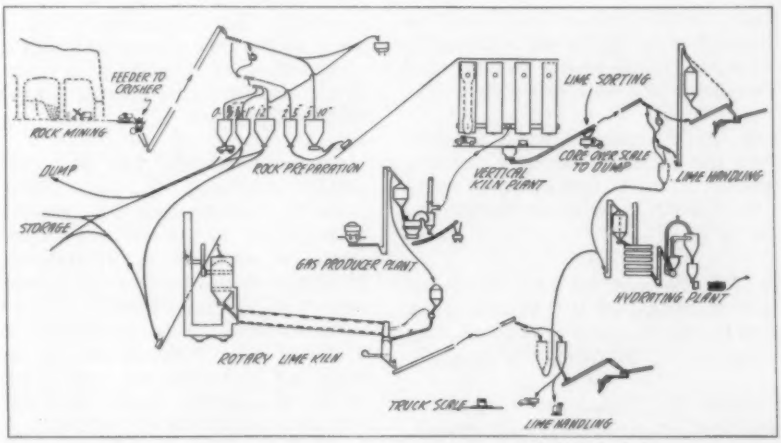
This flow sheet is published due to its general interest, but the plant arrangement is not exactly as shown and all of the units are not being installed at the present, but all were thoroughly considered.

Among the present active projects that we happen to be familiar with is the conversion of a lime plant in Tennessee from stoker to producer gas firing with gratifying results.

The progressive Alabaster Lime Co. of Siluria, Alabama, is proceeding with the installation of mechanical handling equipment and a further increase of its lime plant capacity.

Riverton Lime and Stone Co. will put in service a series of reconstructed gas fired kilns, and at York, Penn., probably the world's largest vertical kilns are being reconstructed to a type by which it is hoped the output will be increased to more than 100 tons of lime per kiln per day.

There are many other changes going on with which we are not so familiar but in all we have the feeling that there is a more rapid moulding of the industry into a new and better shape than ever before.



Flow sheet showing original layout of new Lewisburg, Ohio, lime plant

NEWS ABOUT PEOPLE

RALPH L. DICKEY has been elected president and general manager of the Kelley Island Lime and Transport Co., Cleveland, Ohio, to succeed George J. Whelan, who is now chairman of the board of directors.

Since 1937 Mr. Dickey has been associated with the United States Gypsum Co. at Chicago, during the last two years as manager of its industrial sales division. Prior to this affiliation he had been in the employ of the United States Rubber Co. for several years and was manager of its new products department when he went to U. S. Gypsum Co. He was also president of the New York Wire & Spring Co. at one time. Mr. Dickey is 46 years of age. He graduated from the Sheffield Scientific School of Yale University in 1914 and received a degree of mechanical engineer from Yale in 1917.

Ralph L. Dickey

Mr. Whelan has spent practically all his working life with the Kelley Island company, through the production department as foreman, superintendent, general manager, to president. He was elected vice-president and general manager in 1919 and became president in 1924.

As the head of the largest independently-owned producer and manufacturer of limestone and lime products in the country, Mr. Whelan has, for many years, been recognized as an outstanding leader in the industry. Although he is giving up some of the more active and arduous duties, it is expected that as a member of the company's executive committee and chairman of the board he will remain in close touch with the company's affairs for many years and that the conduct of its affairs will continue to have the benefit of his wisdom, wide knowledge and long experience.

George J. Whelan

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F. F. MCLAUGHLIN, until recently with the General Crushed Stone Co., Easton, Penn., is now associate engineer for the J. Shuman Bower Co., Utica, N. Y.

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J. W. HERMAN has been appointed superintendent of the Atlanta Sand and Supply Co. plant at Gaillard, Ga., to succeed C. M. Cave, who resigned.

•

ALEX W. DANN, executive vice-president, Dravo Corp., Pittsburgh, Penn., was recently elected a district chairman of the Mississippi Valley Association. Mr. Dann is the executive head of the Keystone Sand and Supply Division of Dravo Corp., formerly the Keystone Sand and Supply Co. He is a past-president of the National Sand and Gravel Association.

•

J. G. BRAGG, for a number of years general sales manager of the Alpha Portland Cement Co., Easton, Penn., has been made assistant to the president.

•

J. W. ALEXANDER has been transferred from Spruce Pine, N. C., to Buckingham, Quebec, by the United Feldspar & Minerals Corp.

•

R. A. WETZLER has been appointed eastern sales manager of Pennsylvania-Dixie Cement Corp., with headquarters at the company's office in New York City.

•

BENJAMIN F. AFFLECK, retired president of the Universal Atlas Cement Co., has been elected an honorary member of the Chicago Engineers' Club.

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ALLAN RENTON, president and general manager, Hawaiian Gas Products, Ltd., Honolulu, was a recent visitor of the editor of ROCK PRODUCTS. He is planning to manufacture portland cement in Hawaii.

•

HERBERT E. FOREMAN has been appointed managing director of the Associated General Contractors of America to succeed the late Edward J. Harding. Mr. Foreman has been assistant managing director since 1934, and is succeeded by James D. Marshall, manager of the heavy construction and railroad contracting division.

•

L. B. THOMAS has been appointed sales manager of Aetna Portland Cement Co., Bay City, Mich. For 14 years he has been associated with the Universal Atlas Cement Co., the past two as assistant sales manager in the Kansas City office.

•

SPURGEON BOWSER has been appointed receiver of the Pioneer Materials Co., Tionesta, Penn., on petition of 75 percent of the company's creditors. He succeeds P. B. Baldwin, Meadville, Penn., hardware businessman, who has been receiver for the company since its reorganization in 1937 and who resigned because he could not give sufficient time to his duties. Mr. Bowser at one time was president of the Pioneer company.

(Obituaries appear on page 86)

Iron Oxide vs. Alumina As a Fluxing Agent

In some portland cements increasing iron oxide content at the expense of alumina may have decided advantages. The author found that it also helped kiln operation economies

By ALTON J. BLANK*

ABOUT TWELVE YEARS AGO a series of articles entitled "Iron Oxide Vs. Alumina as a Fluxing Agent in the Manufacture of Portland Cement," was arranged by this writer and appeared in the May 26, July 7 and September 1, 1928 issues of ROCK PRODUCTS. These articles, based upon several years of experiments carried out in a given plant, and upon a cement plant scale of operations, dealt in detail with the economies effected in clinker production efficiencies and costs as a result of the addition of high iron containing ores, slags, etc., to normal raw cement mixtures. Advantages included: (1) increased kiln outputs; (2) decreased fuel consumption per barrel of clinker produced; (3) increased quality of the clinker; (4) improved kiln operations resulting from more uniform burning conditions and decreased lining failures in the kiln, and (5) a lower ratio of raw mixture required per barrel of clinker output. Apart from the above improvements, somewhat easier grindability of the higher iron clinker was noted.

Further data were given concerning the resulting higher iron content cement, and the improvement in quality included: (a) increased soundness of the cement; (b) higher specific gravity and lower Le Chatelier expansion in the cement; (c) considerably higher tensile strengths of cement starting with a 24-hr. test period and ranging through the three months' test period.

In a later article, entitled, "Chemical Composition—Influence on Manufacture and Quality of Cement," appearing in the January 17, 1931 issue of ROCK PRODUCTS, the high alumina contents in raw cement mixtures were discussed, and test data further brought out the advantages to be had, in the way of economy in manufacture and increased quality of product, through the displacement of a portion of the alumina present in

* Vice-president, Cement Atoyac, S. A., Puebla, Puebla, Mexico, and chemical director, Cement Process Corporation.

TABLE NO. 1: CHEMICAL COMPOSITION OF PORTLAND CEMENT CLINKER PRODUCED FROM "HIGH ALUMINA," "NORMAL" AND "HIGH IRON" RAW CEMENT MIXTURES

Composition	High Al_2O_3	Normal	No. 1 (a) High Fe_2O_3	No. 2 (a) High Fe_2O_3	No. 3 (b) High Fe_2O_3
SiO_2	20.73%	20.84%	20.97%	19.77%	20.23%
Al_2O_3	8.29	7.62	6.67	7.31	6.19
Fe_2O_3	2.67	2.98	3.98	4.56	5.13
CaO	64.53	64.58	64.70	64.80	64.73
MgO	2.18	2.18	2.17	2.18	2.18
SO_3	.53	.54	.55	.49	.48
Ign. loss	.37	.37	.40	.36	.34
Alkalis & N.D.	.64	.86	.56	.53	.72
Ratios					
SiO_2/R_2O_3	1.89	1.96	1.96	1.66	1.78
CaO/SiO_2 and R_2O_3	2.03	2.05	2.04	2.04	2.05
SiO_2/Al_2O_3	2.50	2.73	3.14	2.70	3.26
Al_2O_3/Fe_2O_3	3.10	2.55	1.63	1.60	1.20
Free Lime Content	1.47	.87	.54	.46	.40
Physical Tests					
Raw Mixture Fineness—Pass No. 200 Mesh	85.2%	84.7%	84.6%	85.0%	84.8%
Percent Clinker Sound in Boil	48.0%	75.0%	86.0%	91.4%	95.1%
Specific Gravity	3.12	3.15	3.20	3.22	3.23
Operation Results in Kiln					
Production, barrels per hour	49.3	55.4	63.7	64.4	68.0
Fuel Consumption, Gallons Oil per Bbl. Clinker	11.1	9.8	8.8	8.3	7.2
Raw Mix Factor, Lb. Raw Mix per Bbl. Clinker	1.56	1.53	1.47	1.42	1.40

(a) Iron ore added to raw mixture.
(b) Iron Slag added to raw mixture.

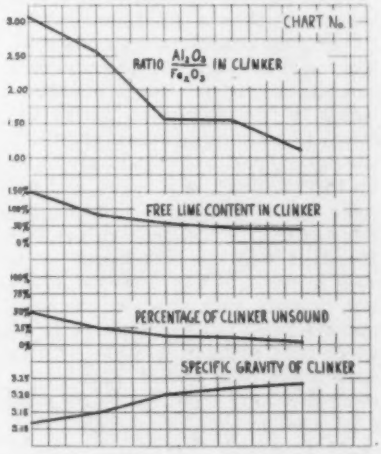


CHART No. 1
RATIO $\frac{Al_2O_3}{Fe_2O_3}$ IN CLINKER
FREE LIME CONTENT IN CLINKER
PERCENTAGE OF CLINKER UNSOUND
SPECIFIC GRAVITY OF CLINKER

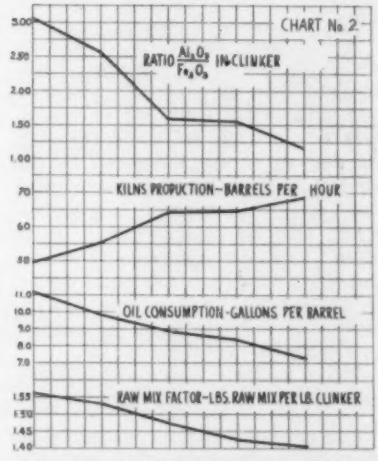


CHART No. 2
RATIO $\frac{Al_2O_3}{Fe_2O_3}$ IN CLINKER
KILNS PRODUCTION—BARRELS PER HOUR
OIL CONSUMPTION—GALLONS PER BARREL
RAW MIX FACTOR—LBS. RAW MIX PER LB. CLINKER

Charts 1 and 2 plot physical tests and operation results in kiln shown in Table No. 1. Every fourth vertical line represents a different raw cement mixture in the table. The farthest on the left is high Al_2O_3 and on the right is No. 3.

high alumina and normal raw cement mixtures, with iron oxide.

Correspondence with a great number of cement plant operators and chemists since that time has revealed that a considerable number of cement plants found it to their immediate advantage to use iron oxide additions to their normal raw cement mixtures, and the corresponding advantages re-reported in kiln operation economies and increased quality of cement, are much in line with those experienced, and reported by the writer.

It is of interest to note that during recent years a number of U. S. Federal and State specifications covering portland cement, have made their appearance. It is of further interest to note that a considerable number of these specifications limit the percentage of alumina that may be present in Portland cement, whereas an increase in the iron oxide content is permitted.[1]

These specifications were not drawn up with any object in mind of assisting manufacturers of portland cement in effecting economies in production. They were drawn up for the purpose of compelling portland cement manufacturers to furnish cement having increased qualities over those shown in the normal portland cement produced up to that time. As a result, and for some years to date, a considerable tonnage of portland cement that has found its way into Federal projects, such as dams, and in State construction projects, such as roads, has been manufactured under specifications in which the alumina content of the cement has been limited. Apparently, there were very good reasons for limiting the amount of alumina that could be present in portland cements coming under these new specifications.

At the time the series of articles, above referred to, were written, it was thought that the accompanying data was sufficiently complete to permit cement plant operators and chemists, as well as others interested in the subject, to make the necessary studies and arrive at general conclusions. Now, however, about twelve years since these articles made their appearance, attention has been drawn to several data, which were not included in that furnished in connection with the several articles.

These data are considered as being of such primary importance in connection with the iron oxide subject, that other data given, and of an incomplete nature, are not thought to be of much value.

[1] A.S.T.M. specifications for five types of portland cement, adopted after this article had been written, limit the percentage of alumina to a maximum of 6.0 for Type II and 4.0 for Type V and the percentage of iron oxide to a maximum of 6.0 for Type II, 6.5 for Type IV, and 4.0 for Type V.

CHEMISTS' CORNER

Reports of investigations in the rock products industries and comments on articles appearing in these columns are invited, as this is the purpose of the "Corner."

S. E. Hutton, in an article, entitled, "Fluxes in Cement Mixes," appearing in the November, 1939 issue of ROCK PRODUCTS, pp. 51 and 52, has attempted to analyze the writer's articles on the subject. Of the results reported by the writer, it is Mr. Hutton's opinion that "possibly fluxing is only one, and perhaps not a very important one of the numerous influencing circumstances." That "the higher strength in the high-iron samples could be accounted for by the increase in the tri-calcium silicate content." That "reduction in fuel requirements and increase in kiln output could easily be a matter of flame distribution, which, with alkalis in the raw mix would be significant in connection with coatings and rings, although soda reduces fusing temperature but little."

Among the data missing in the writer's initial articles, which Mr. Hutton mentions as having a most important bearing on the subject, include, (1) free lime; (2) raw mix fineness; (3) cement fineness.

For the benefit of those who may be interested in the subject and did not have an opportunity to read the writer's articles, as well as taking into consideration those readers who may not care to dig back through their files of twelve years ago in order to freshen their memories, a summary of those articles will be given herewith.

In order to condense data as much as possible, and at the same time include all important data having a bearing on the subject, averages have been taken of the "high alumina," the "normal" and the "high iron" clinker and cements produced over a period of several years and previously reported on. Data, at that time available but not included in the articles, as well as further data made available in the years following the publication of the articles, will also be included in the results to be shown below.

Perusal of results plotted in Table No. 1 show the displacement of alumina with iron oxide in the raw cement mixture, results in a number of operating efficiencies and economies in the kiln. From an operating standpoint the advantages include: (1) a higher kiln output of clinker per hour; (2) a decrease in the fuel consumed per barrel of clinker burned; (3) a decrease in the raw mixture required to produce a barrel of clinker. Previous data showed more uniform kiln operations, fewer difficulties with kiln linings, and somewhat better grindability of clinker.

From the standpoint of quality it is shown that displacement of alumina with iron oxide results in a higher specific gravity of the clinker and increased soundness.

Mr. Hutton's remarks concerning the effect of flame distribution on fuel economy and increased kiln outputs, are well made. In the plant in question the atomization of the kiln oil had, for a number of years, been accomplished through the use of superheated steam carried at around 80 lb. pressure in the four burners situated in the hood of each kiln. The flame was of the short, intense type, and burning was accomplished near the discharge end of the kiln. Owing to the intensity of the flame, as well as its shortness, trouble was often had through the melting of the brick in the kiln hood. During a number of months before this system of atomization was changed, and during which time the high iron raw cement mixtures were burnt in the kiln, the operating efficiencies and economies in the kilns, and the improvement in the quality of the resulting clinker and cement, was in line with that which has been reported.

Some months after the iron additions to the raw mixture had been under way, a different system for atomization of the kiln oil was installed. The four steam burners in each kiln were displaced by two low-pressure air burners in which the air pressure was carried at 3 lb. With the new type burners, better regulation of

TABLE NO. 2: CHEMICAL COMPOSITION IRON ORE AND IRON SLAG

	Iron Ore	Iron Slag
SiO_2	2.40%	26.96%
Al_2O_3	26.24	16.26
Fe_2O_3	69.76	54.26
CaO	.64	1.45
MgO	nil	nil
S	nil	nil
Ign. Loss	nil	nil
Not Det.	.96	1.07

Fuel Oil Characteristics

Gravity Baumé	13.3
Specific Gravity	0.9678
B.t.u. per lb.	18,000
B.t.u. per gal.	146,340

the flame was possible, and a softer and somewhat longer flame was resorted to, resulting in the burning of the clinker farther back in the kiln.

After the installation of the low-pressure burners, the iron addition to the raw mixture was being gradually increased. In order to determine the effect, if any, of the new burners on kiln operations, and clinker and cement qualities, the addition of iron ore to the raw mix was suspended for a period of ten days, and during this time the normal raw mixture was fed to the kilns.

Without going into any great detail, it might be stated that during this ten-day period, the average calcium carbonate content of the iron ore free raw mixture was 74.98 percent; the average raw mixture fineness was 85.0 percent passing the 200-mesh screen; the average iron oxide content of the clinker 3.07 percent; the soundness of the clinker 75.0 percent; free lime content in the average clinker 1.04 percent; average specific gravity 3.14. From the operating standpoint, kiln output averaged 56.7 barrels per hour; fuel consumption averaged 10.1 gallons oil per bbl. From the quality standpoint of the resulting cement, unsoundness was 38.0 percent; Le Chatelier expansion was 6.3 mm.; tensile strength of 3-day 1:3 sands were 210 lb.; 7-day sands 296 lb.; 28-day sands, 378 lb. The average iron oxide content of this cement was 2.64 percent.

Immediately after the above test was suspended and iron ore additions were made to the raw cement mixture, as formerly, the results obtained during the remainder of the month were found to be as follows: Calcium carbonate content of the high iron raw mixture averaged 75.17 percent; raw fineness was 84.8 percent passing the 200-mesh; the average iron oxide content of the clinker was 4.02 percent; the soundness of the clinker was 79.0 percent; free lime content of the clinker was 0.57 percent; average specific gravity 2.20. From the operating standpoint, kiln output averaged 64.1 bbl. per hour; fuel consumption was 8.7 gal. per bbl. clinker produced. From the quality standpoint of the resulting cement, unsoundness was 3.12 percent; Le Chatelier expansion was 2.0 mm., tensile strength of 1:3 sands at 3-days averaged 235 lb.; 7-day sands, 310 lb.; 28-day sands, 406 lb. The average iron oxide content of this cement was 3.03 percent.

While flame distribution in the kiln has considerable influence upon the results obtained, perusal of data in the above tests does not show that the change in the burning installation materially affected results obtained due to the use of high iron raw cement mixtures, and regardless as to the method of fuel oil atomization, or whether a short, intense, or a long and soft flame distribution is obtained in the kiln, the benefits derived through the addition of iron ore to normal raw mixture are manifest.

Cement produced from clinker of high alumina, normal and high iron content, and taken from monthly reports covering a period of about three years' operations, are shown in Table No. 3.

TABLE NO. 3: CHEMICAL COMPOSITION OF PORTLAND CEMENT PRODUCED FROM "HIGH ALUMINA", "NORMAL" AND "HIGH IRON" CLINKER

Composition	Cement No. 1	Cement No. 2	Cement No. 3	Cement No. 4	Cement No. 5	Cement No. 6
SiO_2	20.94	20.98	20.64	20.62	20.02	19.96
Al_2O_3	7.13	6.92	6.83	6.70	6.71	6.42
Fe_2O_3	2.46	2.54	2.61	3.01	3.42	3.98
CaO	63.04	62.94	63.20	63.02	63.26	63.04
MgO	2.01	2.07	2.09	2.07	2.10	1.96
SO_3	1.94	1.92	1.95	1.93	1.94	2.06
Ign. Loss	1.89	1.94	1.84	1.98	1.93	1.90
Alk. & N.D.	.54	.64	.54	.67	.62	.50
Free Lime	1.38	.76	.58	.44	.36	.22
RATIOS						
SiO_2/R_2O_3	2.18	2.20	2.18	2.08	1.94	1.91
CaO/SiO_2 & R_2O_3	2.06	2.06	2.10	2.07	2.10	2.07
SiO_2/Al_2O_3	2.93	3.01	3.02	3.07	2.98	3.10
Al_2O_3/Fe_2O_3	2.85	2.72	2.61	2.22	1.96	1.61
PHYSICAL TESTS						
Cement Fineness Pass No. 200 Mesh	84.3%	85.6	84.9	83.9	84.6	85.2
Percent Cement Sound in Boil	92.42%	95.78%	97.87%	98.09%	100%	100%
Specific Grav.	3.12	3.12	3.13	3.13	3.14	3.16
Le Chatelier Expansion mm.	2.25	2.15	1.92	1.84	1.73	1.68
Initial Set	2:35	2:34	2:33	2:37	2:40	2:31
Final Set	4:49	4:41	4:45	4:49	4:43	4:41
Tensile Strength Lb. Per Sq. In. 1:3 Sands						
24 Hours	96	109	122	141	164	184
3 Days	215	231	225	232	255	272
7 Days	287	302	301	306	311	314
28 Days	377	392	387	400	387	381
3 Months	383	384	397	435	409	406
6 Months	372	383	401	458	421	411
1 Year	368	381	406	462	434	419

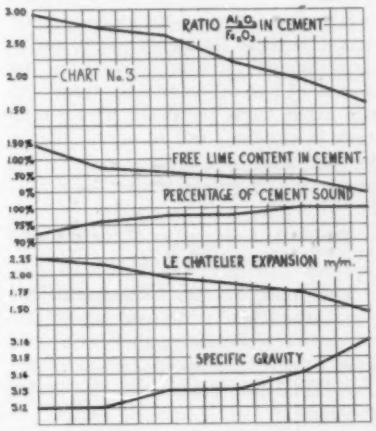

RATIO Al_2O_3 / Fe_2O_3 IN CEMENT
CHART No. 3
FREE LIME CONTENT IN CEMENT
PERCENTAGE OF CEMENT SOUND
LE CHATELIER EXPANSION m/m.
SPECIFIC GRAVITY

Chart of data presented in Table No. 3, above. Beginning with the vertical line at the farthest left, every fourth vertical line represents a different cement in the table, from "Cement No. 1" through "Cement No. 6"

Perusal of data covering cements produced over a period of three years show those products with the lower ratios of alumina to iron oxide to have qualities considerably superior to those cements having the higher ratios of alumina to iron oxide. Improvements include: the gradual diminishing amounts of free lime; increased soundness of product; higher specific gravity; lower Le Chatelier expansion, and marked improvements in the tensile strengths at all ages.

Effect on Tensile Strength

Of particular note is the tendency towards retrogression in tensile strength after the 28-day test period for those cements having the higher ratios of alumina to iron oxide. As the iron oxide content in the cement increases at the expense of the alumina content less retrogression is noted, and with the higher iron content cements this retrogression is eliminated and the cements show healthy increases in strength between all ages of test.

Further along in his article Mr. Hutton remarks that the higher

strength of the "high-iron" samples could be accounted for by the increase in the tri-calcium silicate content.

Without going to the trouble of calculating the compound composition of the cements in question to determine what increases there may have been in the tri-calcium silicate, it may be pointed out that, while higher tri-calcium silicate contents might account to some extent for the increase in strength of the high iron cements at early ages, say, the 24-hr., 3-day and 7-day periods of tests, it would have no bearing on the continued increases in strength shown for the high iron cements after the 7-day period and up to and including the 1-year period of test. The same holds true for any small increases in the fineness of one cement to the other.

In new specifications that have appeared in recent years, it is of interest to note that the alumina content of portland cement for use in Federal and State construction projects, has not been the only component that has been limited.

It is found that the percentage of tri-calcium silicate that may be present in the cement, is also limited to certain fixed quantities, whereas increased amounts of di-calcium silicate are specified.[2] It would appear that the higher percentages of tri-calcium silicate are not desirable, and since they contribute to retrogression in strength of cement at later ages, this is understandable.

The writer has not in the past, nor does he at the present time, make the statement that all portland cements are benefitted through increasing their contents of iron oxide. In his articles on the subject he has analyzed the results that were obtained in one plant, and has not tried to compare these results with those that may be obtained in a number of other plants using a variety of raw materials to form given raw mixtures, and using a variety of kilns and methods of burning in the production of clinker. He is aware, however, that a number of cement plants have found it decidedly to their advantage to increase the iron content of their raw mixtures at the expense of the alumina content in their normal mixtures.

If Mr. Hutton has any further data to contribute to the question of Fluxes in Cement Mixtures, the writer, together with others interested in the subject, would be most interested in having it.

[2] A.S.T.M. specifications call for a maximum of 50 percent tri-calcium silicate in Type II portland cement and 35 percent in Type IV, and a minimum of 40 percent di-calcium silicate in Type IV portland cement.

Specification Essentials

(Continued from page 44)

cost almost the same as trap rock even though it can not stand the service and rigid weather conditions in this locality.

One might then ask: Should not the sizes at least conform nationally?

The answer to this is that because of the difference in quality of stone it often becomes necessary to use different sizes. For example: In those regions where soft stone is available, a larger aggregate such as 3-in. stone might be best for penetration macadam highway because of the crushing action of the roller on soft stone. On the other hand in places where trap rock is available a 2-in. stone should be used since this hard stone will not crush to any extent under the roller.

Regional Standardization of Limits and Sizes

Therefore, limits, tolerances, and results required by routine tests should be written sectionally, considering the most economical and practical material available for that particular region.

It is quite evident that the absolute standardization of definite specifications throughout the United States for definite test limits, or for a single series of standard sizes with exactly the same tolerances, would be economically and practically unsound. However, the present multiplicity of sizes and divergence of tests required by users within a given region is very confusing and works hardships upon the producer.

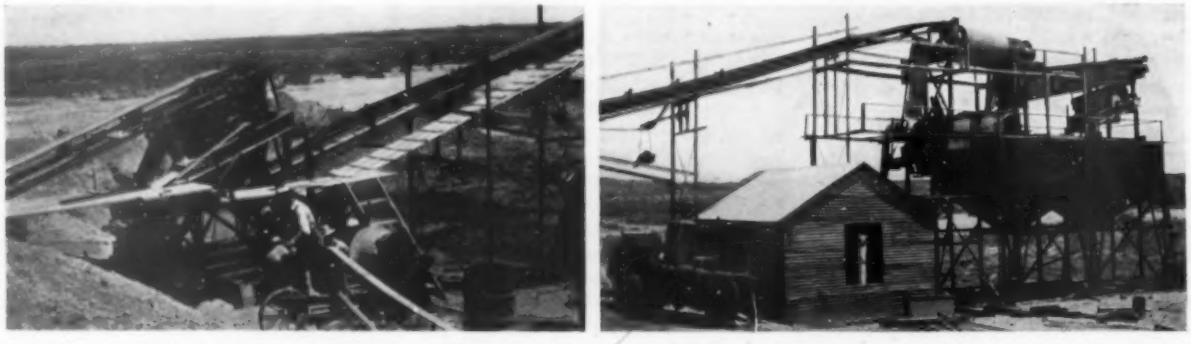
The producer in southern New England is not interested in specifications drawn by the City of Los Angeles. He is, however, vitally interested in specifications drawn by the public works department, highway department, architects, and consulting engineers within this territory. Engineers are very slow to recognize that the exact limiting sizes, or exact range in size for a given product, are not clearly as important as is the question of uniformity of successive shipments of the particular size and grading, specified on any particular job.

Specification limits and tests should be written with attention focused on the most economical use of available material. In any given production region the limits and tests must be the same before the problem is solved.

(To be continued)

Complete New Gravel Plant In Texas

QUITAQUE SAND & GRAVEL CO., Quitaque, Texas, has placed in operation a new sand and gravel plant nine miles east of Southland, Texas, about 30 miles from Lubbock, Texas. Two new D-13000 Caterpillar Diesel engines have been installed, one at Quitaque and the other at the new plant. Other new equipment includes a Telsmith intercone crusher, and two Pioneer screens. Twelve Ford V8 trucks are operated at these plants, eight of which are 95 hp. and four 85 hp. Officers of the company are E. M. Hatton, president; and Thos. J. Crews, superintendent, both at Quitaque.



New plant of Quitaque Sand and Gravel Co. At left is primary screening and crushing unit and at right is the plant proper

NATIONAL ASSOCIATION ACTIVITIES

Sand and Gravel

IN A RECENT EXECUTIVE LETTER to the members of the National Sand and Gravel Association and affiliated groups, Secretary Ahearn brought the attention of the industry to problems of records required by the federal Wage and Hour law. Col. Fleming, Administrator of the Wage and Hour law, recently suggested in a letter to Mr. Ahearn that if members of the association find it a practical difficulty to comply with all the requirements of the regulations governing records that they petition for an amendment of the regulations provided for in Section 516.5. The Wage and Hour division recently modified its regulations with respect to the method of determining the reasonable cost of board, lodging and other facilities customarily furnished to employes by employers. Another problem with which the industry is confronted is the effect on employment of the conscription law, deferment of essential employes, and the legal requirement that drafted employes be rehired at the termination of their service.

Industrial Sand

ANNOUNCEMENT has been made by Executive Secretary V. P. Ahearn that the semi-annual meeting of the Board of Directors, National Industrial Sand Association, will be held at the Hotel Statler, Cleveland, Ohio, on Tuesday, November 12, 1940.

Lime

THE NATIONAL LIME ASSOCIATION has announced that a fellowship has been established at the University of Illinois for the purpose of making X-ray studies of lime. Dr. G. L. Clark of the Department of Chemistry, who presented a paper on this subject at the 1940 convention, has announced that Peter Bernays has been selected as the holder of the fellowship. Although the process of manufacturing lime is very old, there are many unsolved problems. Among these is the difficulty of predicting the chemical and physical properties and practical behavior of the various products of the kiln and hydrator.

In this connection, the lime industry may wish to refer to an article entitled, "Problems in Lime Burning —A New X-Ray Approach," appearing in the July, 1940, issue of *Industrial and Engineering Chemistry*, in the preparation of which Messrs. Clark, Bradley and Azbe collaborated. The following general effects are discussed: high magnesia content, crust formation, the composition and mechanism of formation of cores in dolomitic limes, the dependence of the properties of plastic hydrates upon the particle shape deduced from X-ray patterns, and the effect of rate of hydration upon the development of heat and crystal grain growth and inhibiting effects of magnesium oxide.

Exemption of Seamen

COL. FLEMING, Administrator of the Federal Wage and Hour Law, recently attempted to clarify the position of his division with respect to sand and gravel dredge employes. It is now held that the Smoot ruling applied only to that particular case and that all other companies operating dredges would have to present individual petitions for exemption of their dredge operating employes. The National Sand and Gravel Association has suggested member companies write to headquarters, outlining in complete detail their use of navigable waters of the United States, in order that the Association may present a good case for individual companies seeking exemption for their employes.

COMING CONVENTIONS

National Sand and Gravel Association and National Ready Mixed Concrete Association, Netherland Plaza Hotel, Cincinnati, January 15, 16 and 17.

National Crushed Stone Association, Netherland Plaza Hotel, Cincinnati, January 20, 21 and 22.

American Road Builders' Association, New York City, January 27, 28, 29 and 30.

National Concrete Masonry Association, Sherman Hotel, Chicago, February 10, 11, and 12.

American Concrete Pipe Association, Edgewater Beach Hotel, Chicago, Ill., February 13 and 14.

American Concrete Institute, Mayflower Hotel, Washington, D. C., February 18, 19, and 20.

Crushed Stone

NATIONAL CRUSHED STONE ASSOCIATION issued a bulletin recently calling attention to the ICC order in Ex Parte MC-3, relating to truck drivers of private carriers, effective October 15. If trucks are operated wholly within a municipality or between contiguous municipalities, its operation is subject only to the provisions covering hours of service of drivers. These provide that a driver shall not drive or operate a motor vehicle for more than 10 hours in the aggregate in any period of 24 consecutive hours unless he has 8 consecutive hours "off duty" within the period of 24 consecutive hours. The "off duty" hours may be cumulated in two periods in an approved berth. No driver shall be "on duty" more than 60 hours a week, or 70 hours in 192 consecutive hours if the carrier operates every day of the week. Complete information concerning these regulations as they apply to certain prescribed large city zones and to other operations may be obtained from the Association or the federal Superintendent of Documents in Washington, D. C.

Concrete Industries Exposition

ANNOUNCEMENT has been made that the Concrete Industries Exposition will be held in Chicago at the Sherman Hotel on February 10, 11, and 12. The exhibit will be held concurrently with the annual conventions of the National Concrete Masonry Association, the American Concrete Contractors Association, the National Cinder Concrete Products Association, the Cast Stone Institute and the American Concrete Pipe Association.

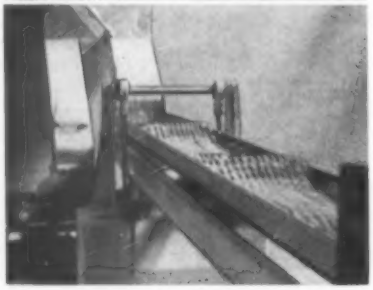
Members of the Manufacturers' Publicity Committee for the conventions and exhibit are as follows: Chairman, E. J. Goes, the Koehring Co.; G. H. Pfeifer, Chain Belt Co., A. J. Gerlach, Paulson-Gerlach & Associates; G. A. Loveall, Construction Machinery Co.; L. L. Jacobs, The Buchen Co.; J. J. Buzzell, Besser Manufacturing Co.; R. Marshall, Stearns Manufacturing Co.; T. J. Harris, J. R. Hamilton Advertising Agency; Roy N. McCandless, National Concrete Masonry Association; Bert Carey, American Concrete Contractors Association; and Louis Brookman, Jr., Concrete Industries Exposition.

Hints and Helps

★ FOR SUPERINTENDENTS ★

Cooling and Handling Rotary Kiln Lime

IN HANDLING LIME as it comes from two rotary kilns in the modern plant of H. E. Millard, Annville, Penn., two



Above: Chains in skipulter reduce lime temperature and retard movement. Below: Close-up of the chains in skipulter

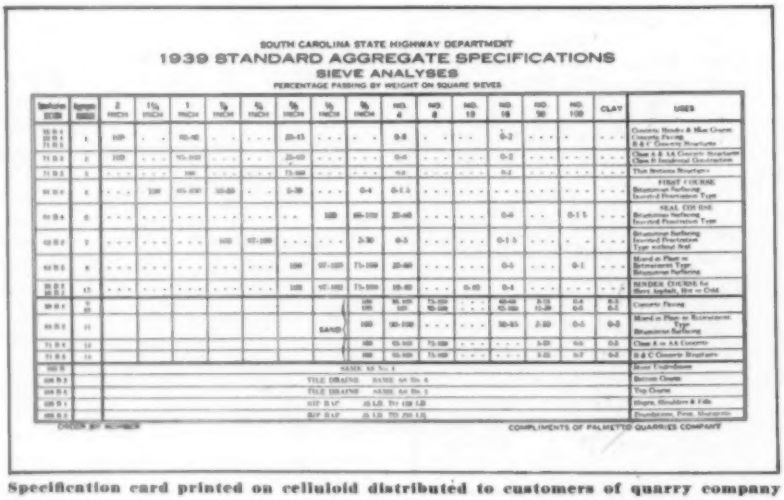
F. L. Smidth 18-in. skipulters ("shaking conveyors") convey the lime from the kiln coolers to hoppers from which skip hoists place it in bins. Men are stationed at the skipulters to pick out any faulty particles.

These skipulters have been fitted with a series of chains as shown in the illustrations which are of benefit in several ways. The chains are about 22 in. long, and are connected to the conveyor in rows, as shown, at intervals 10 ft. apart.

As the skipulter reciprocates, the chains stretch out over the bed of lime as shown and further help to reduce the temperature of the lime by radiation. The chains also retard the movement of lime and stir up the bed of material thereby making the lime picker's job easier. There is also a slight scouring action which is likely to dislodge any coal film from the lime particles which is later removed as dust.

State Specifications On Card Advertise Producer

PALMETTO QUARRIES CO., Columbia, S. C., distributes to its contractor friends and other customers a celluloid card 3- x 5-in., on one side of which is printed a complete tabulation of the South Carolina State Highway Department standard aggregate specifications, and on the other side is the name of the company, phone number, address, and the products it makes in black lettering with the trade mark "Columbia Granite" in red. The specification analysis gives the specification section, the aggregate number designation, the percentage passing by weight on square sieves, and the uses. This handy card may be easily cleaned should it become soiled.



SOUTH CAROLINA STATE HIGHWAY DEPARTMENT

1939 STANDARD AGGREGATE SPECIFICATIONS

SIEVE ANALYSES

PERCENTAGE PASSING BY WEIGHT ON SQUARE SIEVES

Specification card printed on celluloid distributed to customers of quarry company

Keeping Records on Aggregates Production

J. K. DAVISON AND BRO., Pittsburgh, Penn., keeps a complete record of crushed gravel production, as shown on the accompanying form. It not only identifies the material as to its destination, specification requirements, and the name of the person who sampled it, etc., but it contains a lot of other pertinent information. It is sometimes important to check back and find the analysis, bin in which the gravel was stored, grading, etc. In the lower right-hand corner space is provided to show the crushing

J. K. DAVISON & BRO.

CRUSHED GRAVEL ANALYSIS

Simple form for recording production

process and the size of the feed, etc. which governed in producing a given specification.

Recording Slippage of Belt Drives

By W. F. SCHAPHORST

I WAS INTERESTED not long ago in getting a record of the amount of power that was transmitted through a belt drive. A recording instrument was used to measure the power that was being transmitted through the drive. The belt was slipping, however, and was not carrying as much power as was desired, so the superintendent decided that he would trying covering the pulleys with canvas. He did so and the recorder immediately showed a "hump" at the point where the covering was applied, and from that time on there was no more slipping and more power was transmitted.

A little rough calculation proved to my own satisfaction that the belt had been slipping about 5 percent. The covering reduced the slip to 2 percent, which doubtless is due to

the natural creep always to be found in a belt and which cannot be avoided. Besides, it is quite possible that the belt will last longer now that the slip is reduced. Friction is the thing that wears out belts, and the principal friction in a belt is that due to slip. On the other hand, it is better to avoid slip without the use of covering if possible.

Preventing Segregation in Railroad Cars

IT MAY not be considered an efficient way of doing it, but the illustration at the right shows how segregation in car-loading is prevented in a southern crushed stone plant.

The movable end of the chute, or baffle, is hinged and moved back and forth to spread the stone uniformly across the width of a railroad car. As the chute is normally built the gravel would drop into the far side of the car.

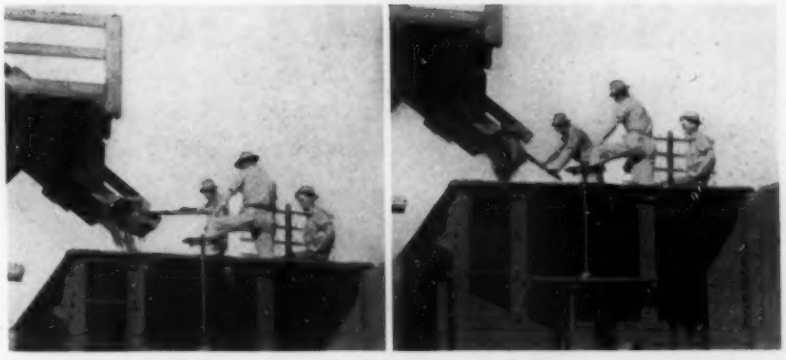
Spiral Mixing Chute

BEYER CRUSHED ROCK CO., Kansas City, Kan., has developed an unusual scheme to assist in blending various stone sizes in meeting any specification.

As shown in the illustrations, a belt conveyor inclines upward from a tunnel beneath six bins in the screening plant, and dumps into a hopper to the bottom of which has been welded a spiral chute. The stone passes through the chute and is dropped into a belt bucket elevator which carries the material back into the plant where it is either chuted into waiting trucks in the tunnel below or may be stored in a surge bin.

It will be noticed that the end of the spiral chute feeding the bucket elevator is at almost a vertical angle with respect to the buckets. This obviates the necessity for having a boot at the bottom of the elevator, and the spiral chute also materially assists in mixing the materials. Both the tunnel conveyor and the belt bucket elevator are driven from a single drive shaft by means of pulleys.

The plant structure itself is of interest as it is built of one-man stone masonry, reinforced concrete, and steel sheathing, making it practically fire-proof. Louis Marino is president of the company.



Hinged chute, raised and lowered by lever, distributes crushed stone uniformly

Eliminating Spontaneous Combustion in Coal

AS LARGE QUANTITIES OF COAL are stockpiled or held in bins by the rock products industries, the precautions advocated by Vernon G. Leach, chief combustion engineer, Peabody Coal Co., for the elimination of fire hazard should be of general interest. Some of the processing methods devised by his company to reduce the fire hazard from spontaneous combustion were outlined recently in the *Chicago Purchaser*.

The first step was to eliminate ultra fines and then remove impurities by specific gravity separation, thus reducing the ash content by a full third. This refining method is so precise that variation in the percentage of ash in the final product can be held within the limit of one percent. Impurities are rejected to a "gob" pile, where their inherent susceptibility to spontaneous heating is demonstrated by a constant smouldering, even though the pile contains very little combustible, being composed almost entirely of rock, slate and pyrite.

Storage piles of 1½-in., 1-in. and ¾-in. stoker coal, refined as described above, have been put down during the hottest part of the summer in various parts of the country. Except for taking temperature readings, these storage piles were untouched for periods of one, two and three years. At no time was there the slightest indication of spontaneous heating.

Where coal is given rough treatment, such as the use of a drag scraper for reclaiming from stockpiles, any other excessive crushing action producing a large amount of fine dust, spontaneous heating might result.

Left: Showing spiral chute with the end tilted up where it feeds into the elevator buckets. Center: End view of chute and tunnel conveyor feeding into hopper. Right: Tunnel conveyor and belt bucket elevator driven from single drive shaft, pulleys, and drive belts

Sand and Gravel Outlook

National Sand and Gravel Association directors meet and exchange views

By NATHAN C. ROCKWOOD

FOR THE FIRST TIME since he has been executive secretary, V. P. Ahearn had to miss a directors' meeting of the National Sand and Gravel Association, held in Washington, D. C., October 10 and 11. Except for a few minutes during which he spoke briefly, the well beloved secretary was confined to his home as the result of a minor surgical operation. In his absence, Stanton Walker, engineering director of the association, did double duty—and very well and nobly.

With President PAUL P. BIRD in the chair the meeting began with a discussion of the approaching 25th annual convention of the association, Cincinnati, Ohio, January 15-17, by Stanton Walker. It was generally agreed that the type of program developed at recent conventions—an informal round-table discussion—was the most desirable. A special effort will be made to emphasize the silver anniversary of the association, which has had a continuous existence since November, 1916, when the original meeting was held in Chicago, Ill., at the invitation of the publisher of ROCK PRODUCTS.

Chert Problem

Following the discussion of the convention program, STANTON WALKER reported on the activities of the engineering division of the association, with particular emphasis on the problem of chert, which faces so many producers in the south central part of the country. He defined chert as "extremely fine-grained silica, chemically the same as quartz but differing from quartz merely in the size of the crystals." He said something like the same problems may affect in some degree quartz gravels; hence the interest in the so-called chert problem should be widespread.

According to Mr. Walker, the Kentucky state highway specifications already eliminate chert; in Tennessee the chert gravels are still used in the western part of the state; in Missouri the fate of chert gravels for state highways is now in the balance. The concrete pavement defects attributed to "bad" chert gravels are map cracking, frequent transverse cracks, spalling of the concrete, etc. These defects do not happen with all chert gravels, nor do they happen all the time with bad chert gravels, Mr. Walker said. Where the gravel has been allowed to dry out thoroughly in stock piles the bad results are not so obvious as where fresh unseasoned gravel is used. Evidently the defective gravel comes from saturated pieces of chert; that once dried out the same chert never again becomes fully saturated. Hence thorough drying as part of the plant processing may be the answer; or there are possibilities of waterproofing the pieces of gravel; or maybe a better design of the pavement.

Mr. Walker also touched on bad experience with certain chert gravels in California, where the effects were held to be caused by a high alkali content in the cement. Formation within the pores of the gravel of sodium and potassium silicates is supposed to have been a factor. The absorption of cherts runs from 1 to 8, 10 or even 12 percent; some specifications set a 3 percent limit.

Production Problems

Mr. Walker next emphasized the production problems brought about by increasing requirements for fines in fine aggregate—a tendency that ROCK PRODUCTS has been emphasizing for several years. It is now common practice, Mr. Walker said, to demand 10 to 15 percent through a 50-mesh, and several percent through the 100-mesh. The reason, as has been stated often in ROCK PRODUCTS, is primarily because portland cements are much finer ground and no longer contain appreciable amounts of 200- and 100-mesh particles, which partly served the purpose of fine aggregates.

To meet the production problem in the Pittsburgh, Penn., territory, RAY WARREN said the Ohio River dredging companies were getting fines by selective digging and changing washing and recovery processing to get 10 percent through a 50-mesh and 2½ percent through 100-mesh. Also, these producers had had very successful experience in grinding sand to produce fines. This resulted in appreciable amounts of minus 200-mesh and even 300-mesh, which being clean sand, should be allowed for in the specifications.

There is some difficulty in blending the ground sand with the natural, in that some of the ground sand may not stand up in the sodium sulphate test. The ground sand to be used for blending has to be selected with that in mind.

B. V. HEDRICK, describing his North Carolina operation, said that by perfecting his washing process he could recover 10 to 30 percent minus 50-mesh, 2 to 10 percent minus 100-mesh, 4 percent minus 200-mesh; which may be requirements in new government specifications. Mr. Hedrick has a very large scrubber and a very large sand drag, which handles 1500 g.p.m. of water. The gravel is freed of all its fines in the scrubber, and some of the sand is probably ground there.

Soft Stone Eliminators

STANTON WALKER brought up the matter of the Los Angeles rattler test for gravels and its unpredictable results as to the quality of the gravel. This led to a discussion of soft stone eliminators. RAY WARREN said eight or ten impact crushers had lately been introduced into plants in western Pennsylvania to serve as "soft stone" eliminators. They seem to be giving good results. Gravel that had been through these crushers could pass a 35 percent Los Angeles rattler maximmum, whereas the raw gravel ran over 40 percent. Both speakers warned against putting the tailings from these crushers into the sand stream. Mr. Walker said the development of a soft stone eliminator was a matter of importance to the industry.

Special Sands

MR. WALKER said specifications for masonry mortar sands were causing trouble because few producers were prepared to make these special sands regularly. Most producers apparently merely rob their concrete sands of fines for mortar sand. There followed a discussion as to whether minus 20-mesh sand for mortar could best be screened or classified hydraulically. ALEX. FOSTER and HAL. OWENS said it was feasible to screen to minus 14-mesh, wet, using plenty of water and slotted screen plates. In regard to

(Continued on page 72)

Directors of Sand and Gravel Association Meet

Informal views of the Directors of the National Sand and Gravel Association taken during their recent Semi-Annual Meeting. 1—Luncheon at University of Maryland, President Paul Bird introduces President Byrd, of the University. 2—Engineering Director (Professor) Stanton Walker shows off his laboratory, H. P. Caldwell and J. F. Berger. 3—Vice-President Otto Conrades and Director J. F. Berger. 4—Prof. George C. Ernst and Dean Steinberg, college of engineering, University of Maryland. 5—Directors Edgar L. Wade and Harris N. Snyder. 6—Alex. Foster, Jr., past-president, in a thoughtful mood. 7—Director of Engineering Walker and President Paul Bird. 8—Left to right: Otto Conrades, Anderson Dana, Ray Warren, B. V. Hedrick, and Paul Bird

FELLOW CITIZENS!

There are two ways of achieving POTENCY in our NATIONAL ECONOMY, essential to meet the INTERNATIONAL CRISIS, which threatens our mode of life and our most cherished institutions.

One is Coöperation and the other is Coercion. Those who have made the International Crisis are using Coercion. In this country we propose to use Coöperation.

There's a vast difference between the meaning of these two words—just as there is a vast difference between our political inheritance and theirs.

That's why *voluntary* associations have always played a large part in our history. They are essential to maintenance of our liberties because they are natural vehicles of coöperative expression and action.

Fellow citizens who make your livelihood in these industries! It is your duty and it will prove your pleasure and profit to attend the 1941 conventions of your industry.

Silver Anniversary Convention of the **National Sand & Gravel Association**

held in conjunction with Eleventh Annual Convention of

National Ready Mixed Concrete Association

Netherland Plaza Hotel, Cincinnati, Ohio

JANUARY 15, 16, 17, 1941

Twenty-fourth Annual Convention of **National Crushed Stone Association**

Netherland Plaza Hotel, Cincinnati, Ohio

JANUARY 20, 21, 22, 1941

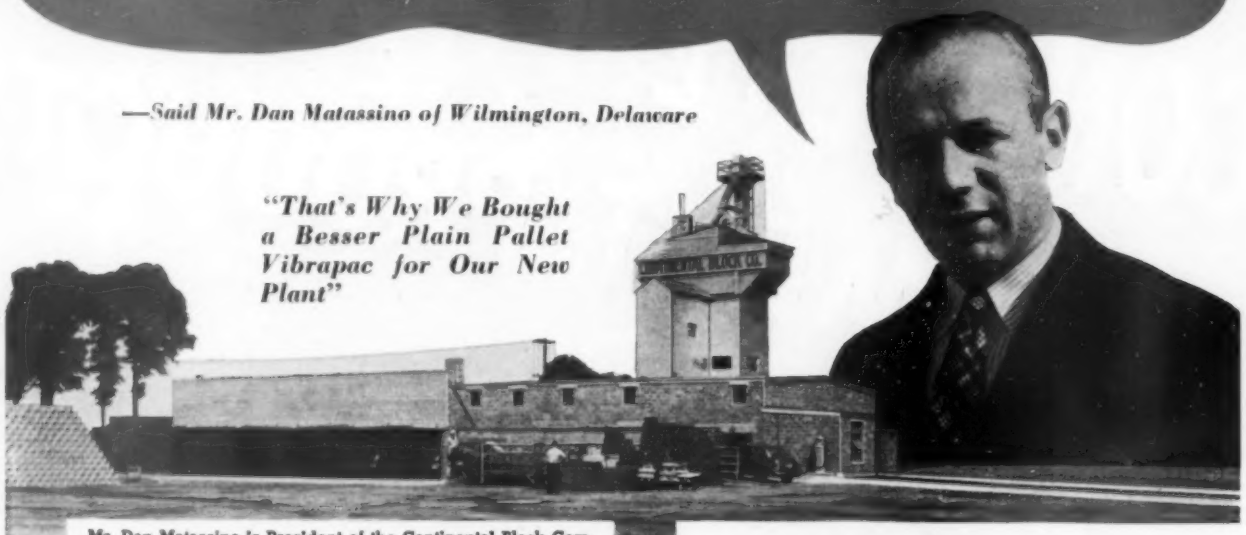
CONCRETE PRODUCTS AND CEMENT PRODUCTS

The Complete Concrete House

Modernistic home built by A. C. Dallach Co., La Grange, Ill., in Western Springs. Waylite block, furnished by Chicago Insulcrete Co., are used for all bearing walls and partitions. Both first and second floors have concrete joists and slabs

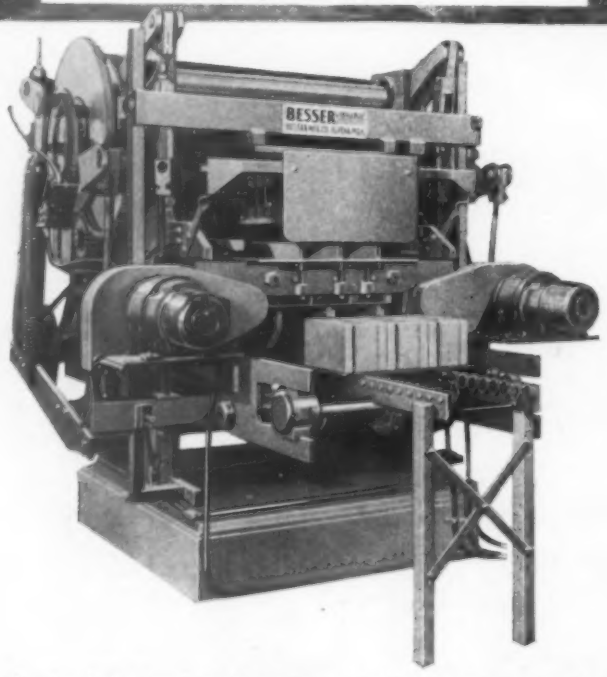
"We Had to STEP UP or STEP OUT"

—Said Mr. Dan Matassino of Wilmington, Delaware



"That's Why We Bought a Besser Plain Pallet Vibrapac for Our New Plant"

Mr. Dan Matassino is President of the Continental Block Company of Farnhurst, Delaware (suburb of Wilmington). The new plant of the Continental Block Company is one of the most efficient and completely equipped plants in the country. Send coupon below for complete details of this plant. Pin the coupon to your letterhead is all you need to do.



Undirectional vibration under Flam patents was used to make the first vibrated blocks ever made on a production basis and sold commercially.

BESSER MANUFACTURING COMPANY

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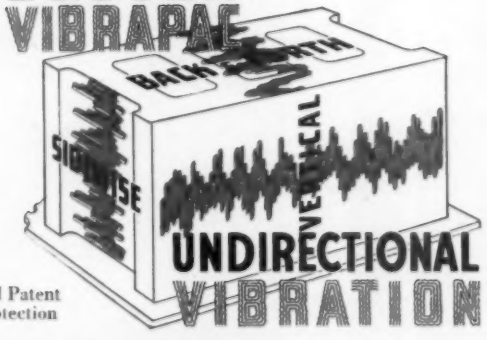

Full Patent Protection

BESSER PLAIN PALLET STRIPPERS

A Besser Plain Pallet Stripper For Every Need

TAMPERS	Besser Super Automatic - -	8 Hr. Capacity 3120
	Besser Victory Automatic - -	8 Hr. Capacity 2160
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	Besser Champion, Power Operated,	8 Hr. Capacity 1000 to 1200
	Besser Multi-Mold, Hand Operated,	8 Hr. Capacity 250 to 350
VIBRATORS	Besser Super Automatic Vibrapac -	8 Hr. Capacity 4800
	Besser Victory Automatic Vibrapac -	8 Hr. Capacity 2160
	Besser Master Vibrapac, Hand Operated,	8 Hr. Capacity 800

Write NOW for details. State sizes and production wanted.

HOW MR. MATASSINO FIGURED THE THING OUT

BESSER MFG. CO., Alpena, Mich.

Please tell us how Mr. Matassino figured out the problem of a new machine—that is saving his company more than $70.00 a day in production cost.

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City ..... **State** .....

It is understood this does not obligate us in any way. 2.

THE SAVING IN PALLET COST WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER!

Finished section of precast concrete bulkhead at Miami, Fla. Units are interlocked and supported by steel rails

By HARRIE H. BIERMAN

Precast Concrete Sea Wall

Diatomaceous silica in mix resists chemical action of salt water

For the past 14 years Shore-Line Builders, Inc., Jacksonville, Fla., has been specializing in the erection of concrete seawalls, bulkheads and revetments. The firm's operations include shore-line protection work, public and private, from the Carolinas on the southeast coast to the Gulf areas of Southwest Texas.

Carl Weber, the company's head and consultant, was associated with Col. George W. Goethals in the building of the Panama Canal and, later, in the Concrete Ship Division of the United States Shipping Board. Fred Weber, his son and vice-president of the corporation, who is in active charge of field operations, has participated in marine construction work in Europe, in the Orient and in South Africa, as well as in the United States. J. F. Blocker, construction superintendent, has been associated with Shore-Line for over 12 years, previously having been connected with various maritime projects.

"Concrete which is highly satisfactory for highways or office buildings," Carl Weber points out, "soon may crumble, if exposed to salt water. And fresh water, too, may offer even greater dangers to permanency, when polluted with acids, alkalis or other deteriorating elements. The most effective remedy seems to encompass the entire routine of concrete production from formulae to aging.

"For marine use concrete not only should be dense enough to be water-resistant but should contain some immunizing agent to neutralize the decomposing influence of salt water. Even if there were no moisture penetration, in construction of this kind there is the ever-present hazard of a break in the outer surface.

How Concrete Is Attacked By Sea Water

"Factors entering into the chemistry of submerged concrete are many and varied, dependent on the presence of waste materials from the discharge of sewers, manufacturing plants and soil drainage systems, as well as climatic conditions and the natural effect of seawater. While the subject in its entirety therefore is a rather complex one, the reaction of salt water alone is reasonably simple of explanation."

When the physical structure of concrete is sufficiently porous to admit of infiltration by seawater, the magnesium sulphate and the magnesium chloride in the latter change the free lime, formed by the hardening of the mixture, into a calcium sulphate. The expansive force developed by crystallization, and by the water taken up by the calcium sulphate, has a tendency to break down the surface of the concrete to the depth of salt water penetration. Gradually separated from the structure, fragments easily are removed by wave action or even by gravity, exposing a new surface to the same disintegrating process.

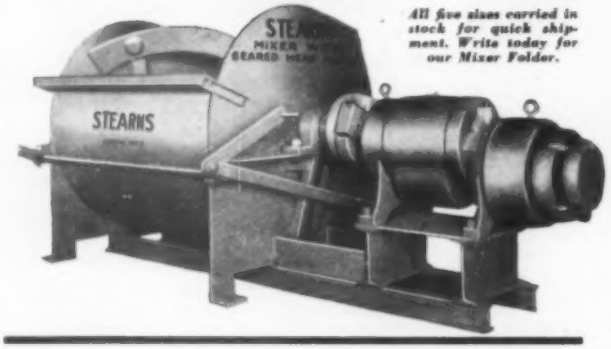
Concrete sea wall slabs and anchor plates ready for curing and aging which requires a minimum of four weeks

6 REASONS for Buying A STEARNS

1. Heavy all steel construction in **all** five sizes — 3, 12, 18, 28 and 42 cu. ft.
2. The mixing shell is equipped with tough, wear-resisting bar type liners — (not castings) — that are easily and cheaply replaced.
3. Mixing blades are of ribbon type and made of extra hard "Sterloy" steel. (Paddle type blades optional.)
4. Bearings — Finest ball bearings. Take both thrust and radial loads.
5. Discharge door control is on the operator's side — where it should be. It works easily without latches or catches — **locks tight.**
6. It has the lowest charging height of any concrete products mixer, with a convenient shelf on which to rest the bag of cement.

Stearns Mixers, Skip Loaders and Block Machines (Jolterete and Tamp Type) provide ideal combinations for turning aggregates into profitable, fast selling concrete products. Let us suggest the combination best suited to your need. *No obligation.*

STEARNS
MANUFACTURING CO. - ADRIAN, MICH.
GEAR OLDEN, PRESIDENT



All five sizes carried in stock for quick shipment. Write today for our Mixer Folder.

This attractive, small concrete house is one of forty built in industrial Chicopee, Mass., by H. D. Fiedler and Associates. Prices, with lot, ranged from $2,800 to $3,500.

They came....
They saw....
They bought....

40 more like this CONCRETE DEMONSTRATION HOME

"Open for inspection" sign points the way to new sales for Chicopee, Mass., builder

H. D. Fiedler, of Highland Park in Chicopee, decided that specializing in good construction—with firesafe concrete—should be just what the doctor ordered for his market. Then, because he couldn't pass out samples of concrete houses, HE BUILT A DEMONSTRATION HOME.

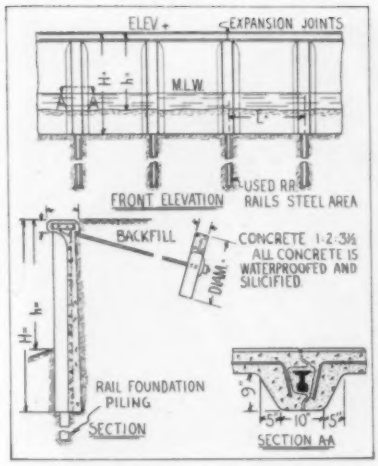
On one day in June, 15,000 people visited this house. They walked on its sag-proof floors . . . touched and felt the fine-textured wall finishes . . . saw for themselves the features which distinguish concrete houses from less durable types of construction. Very soon, 40 similar homes were being built with plans underway for a total of 95.

Show Them—and *Sell* Them

You know that people like concrete's beauty and comfort; its firesafe, storm-proof strength; its moderate first cost, low upkeep and high resale value. But don't forget—the public needs constant selling. And your strongest selling weapon is *a demonstration home!*

Builders, concrete products manufacturers, concrete contractors, material dealers and ready-mix firms can profitably cooperate locally to build concrete homes—to demonstrate and advertise them. That's the way to get your share of residential business with this fastest-growing type of home construction.

PORTLAND CEMENT ASSOCIATION
Dept. 11-45, 33 W. Grand Ave., Chicago, Ill.



Elevation and cross section details of precast concrete sea wall

In Southern waters higher temperatures speed up chemical action. And in some areas a high iodine content in the water has a further tendency toward creating a spongy condition in marine concrete.

"Frequently carbonic acid and other elements in the air and water," continues Mr. Weber, "form a thin covering on the outside of the concrete by transforming surface lime into calcium carbonate. This material has great resistance and elasticity. It frequently disguises the actual condition of the structure, which may be in a state of advanced decomposition beneath this thin outer surface shell. If the latter be broken, the magnesium sulphate formation usually is plainly visible in the form of a whitish substance, soluble in water."

Add Diatomaceous Silica To Concrete Mix

Naturally the first step toward permanency in marine concrete would be to prevent, as far as possible, the chemical change by which the free lime becomes calcium sulphate. This is accomplished by binding the free lime, as rapidly as it appears in the hardening process, into calcium silicate, which has a high chemical resistance to saline and acid influences. To accomplish this objective, Shore-Line's method includes the addition to the mix of 2 to 2½ lb. of diatomaceous silica per bag of cement.

Variously known as Kieselguhr or infusorial earth, diatomaceous silica is marketed, too, under the trade names of "Diatomite" and "Celite." The first is a Florida product and the second has a California origin. Its inclusion in the mix adds to its workability and to its density. Its use is almost imperative in sub-aqueous concrete subject to frost action or possible damage from heavy floating objects, which could cause a break in the outer surface of the structure, exposing inner portions of the concrete to salt water or other chemical influences.

Shore-Line may alter some of its concrete production routine to fit the particular job in hand but it holds to certain constants, affecting density and the process of silicification. On the "must list" are proper curing and aging, which means pre-casting, and the use of only fresh water in the mix. Regardless of any extra effort and expense that may be involved, the rule in respect to the latter never is broken.

The firm's slab-yard is set up at the scene of construction operations, if it is practical to bring fresh water to that point. Otherwise, the yard is located where proper hydration is possible. No chances are taken on neutralizing the silica content of the concrete by introducing into it one of the chemicals it is most anxious to exclude.

There have been on the market various foreign-made brands of cement for which their manufacturers claim such a high resistance to the reaction of salt water that it may be used safely in the mix. Based on his own experiments with them and upon his observation of their use by others, his conviction stands that, even if they are available at the present time, better results are obtainable by fresh water hydration. Moreover, transportation of the water by boat or barge, if necessary, usually is less expensive in the end.

As the exposure of new concrete to salt water influence has a tendency to slow down or suspend entirely the silicifying process, the slab undergoes a five to seven-day curing period, during which it is covered with sand or canvas and kept uniformly moist with *fresh* water. A minimum of 20 days is allowed for hardening under normal atmospheric conditions.

Manufacturing Method And Installation

Shore-Line's method of bulkheading employs used steel railroad rails as piling to support the concrete slab which forms the protection wall. The rails are driven into bedrock to the point of refusal and their exposed ends are cut to the required height with an acetylene torch. If it is necessary to augment their bearing capacity or to limit penetration into soft rock formations, steel shoes are electro-welded to their bearing ends.

The design of the slab and its dimensions depend upon the type of wall to be constructed. The company recently completed at Miami, Fla., 4300 ft. of bulkheading of the kind it designates as "Type C."

Cast in adjustable steel forms, the slab for this job was 5½ in. x 7 ft. x 10 ft., having at either end a pilaster, which forms one-half of an expansion joint interlocking the adjoining slab when set in place. The reinforcement "grid" or "basket" was composed of ⅜-in. and ⅝-in. steel, having a graduated spacing, which varied from 3 in. at the bottom of the slab to 10 in. at the top. Vertical steel projected 18 in. above the latter, and was used later to tie in the concrete coping, included in the specifications of this type of wall.

Circular holes, 1½-in. in diameter, extending through the slab one-third of the way in from either side and an equal distance down from the top, provided for the attachment of coping form-brackets and of the metal slings used to handle the slab during the setting operation. Shallow recesses cast into each pilaster exposed a 3-inch section of ⅝-in. steel. Slipped over this at the time of erection, a ¾- x 20-in. steel suspension bar (double-ended hook) ties the slab to the piling.

The anchor plates, concrete discs 5- x 30-in., were cast with a 1½-in. circular hole at the center to receive the steel anchor bars, which are connected at their off-shore ends to the piling.

The mix used for slab and anchor plates on this job was 1:2:3½, plus the addition of diatomaceous silica, as above stated. To increase density, the size of coarse aggregates was held to ¾-in. The mix received a thorough puddling but no mechanical vibration. Vibration is used, however, in the production of concrete intended for seawalls designed to withstand strong wave action. On the Miami job little provision for that is necessary.

Marine protection walls constructed at Port Arthur, Tex., Palm Beach, Fla., and at other locations throughout the South 12 to 14 years ago show no signs of deterioration and have needed little or no upkeep.

Buys Ready Mix Truck

BEIN & PETER Co., Belleville, Ill., has placed a new 2-cu. yd. Rex mixer truck in service. In addition to the new Rex unit, the company operates a Smith mixer unit on a Ford chassis, a 3-cu. yd. Jaeger on a Dodge chassis, and two other Rex units of 1½ cu. yd. capacity on International chassis. Three Ford trucks with Thornton dual drives are also operated. W. W. Peter is president.

Plan Now to Attend

THE "*NUMBER ONE*" SHOW OF '41!

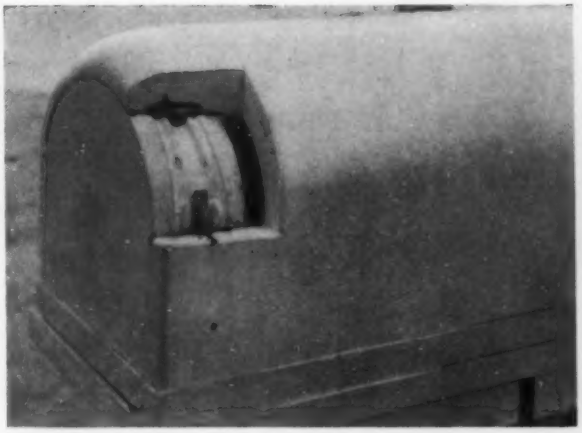
Be prepared for better business! Make your plans now to be among those present when the doors open on the Concrete Industries Exposition for '41! Get the "low-down" on what's new in ideas, materials, machines and methods! You owe it to yourself and to your profits to see the new machinery developed for mixing, manufacturing, pumping and placing concrete. You owe it to yourself to attend the "open forum" meetings of the Conventions* which will be held in connection with the Exposition. New methods and materials will be discussed, ideas will be exchanged, old friendships will be renewed and valuable new friendships made.

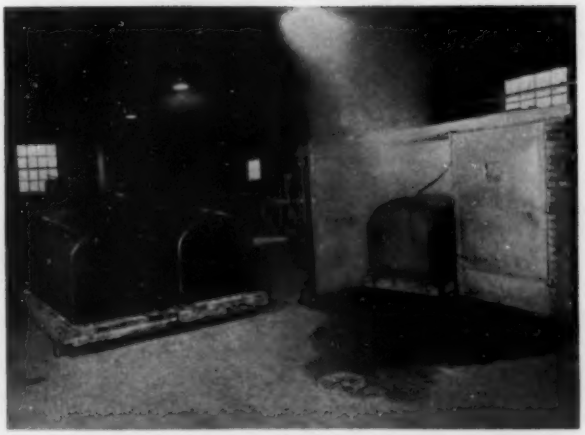
1941 promises to be a boom year for all who are interested in concrete and concrete products. There's one good way to prepare to get your share of this boom—and that's to be all set to go with the latest and best in equipment, methods and materials. No matter how you look at it, you'll be in a better position to keep up with the parade after attending this great "show with a purpose." To step out in '41, step up to the Concrete Industries Exposition!

*Annual conventions to be held concurrently with the Concrete Industries Exposition:
National Concrete Masonry Association • American Concrete Contractors' Association
National Cinder Concrete Products Association • Cast Stone Institute
American Concrete Pipe Association • Illinois Builders' League

CONCRETE INDUSTRIES EXPOSITION

FEB. 10 - 11 - 12 **CHICAGO** **HOTEL SHERMAN**





Left: Cut-away section of concrete burial vault, showing how end of door is sealed. Right: Vaults under steaming process in kiln. Note method of introducing steam into interior of vault with a pipe

NEW DESIGN CONCRETE BURIAL VAULT

Cast burial vault in one piece with door sealed into end of unit

SOME NEW IDEAS in concrete burial vault design and methods of manufacture are employed by the Holz Mausoleum Co., Cleveland, Ohio. This company is a licensee of Frank Holz, the inventor, who developed the vault after seven years of research and holds several patents relating to its design. Mr. Holz is vice-president of the company in charge of manufacturing.

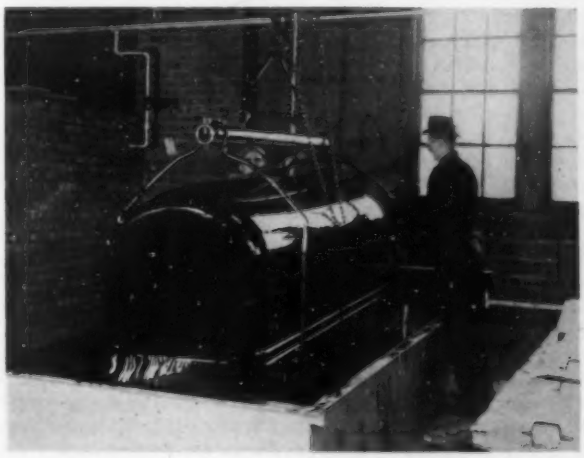
The Holz burial vault is cast in one piece without any jointing and has a minimum opening to seal, since the opening is at one end which is sealed up at the burial before lowering. As the door is 6-in. thick and permanently sealed, as shown in the illustration, it is next to impossible to remove it when fastened into place.

Seal Vault at End

The door is beveled inward and recessed to fit snugly. Above the door are three holes through the shell, each one inch in diameter, which with those on the sides, continue down to the bottom of the door, providing a concave ½ in. deep in both the door and shell. Through the center hole, with the use of a pressure gun, the narrow opening between the door and the shell is filled with a sealing material whose chemical treatment prevents it from ever completely hardening.

Into the side holes, also filled with sealing compound, are forced 1-in. thick steel rods which wedge the door against any movement. A strip of wool felt placed around the edge of the door serves as a gasket for the sealing compound. Near the top of the door is a reservoir which holds a gallon of sealing fluid free to flow into the groove by gravity to assure continuity of the seal all the way around.

Lightweight concrete, of carbon aggregates and portland cement, is used in the manufacture of the door and the shell, with a semi-wet mix and



Vault subjected to the asphalt dipping process

Concrete being vibrated into place in mold

INFRINGEMENT NOTICE

To Builders and Users of Block Machines

Please take notice that the Stearns Manufacturing Company of Adrian, Michigan, are the sole and exclusive licensees of "Joltcrete" vibration block machine patents and patent rights and have the sole and exclusive right to manufacture and sell such equipment.

At the present time there is a suit for patent infringement pending against a New York concrete products plant (name given upon request), a user of infringing equipment. Others manufacturing infringing equipment and the users of such equipment will be prosecuted to the fullest extent of the law.

Louis Gelbman, Inventor
Suite 2001, 350 Madison Ave., New York, N. Y.

- Vibration
- Pressing
- Uniform Density
- Trowelled Surfaces

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KENT-ROOT VIBRA-PRESS

The KENT MACHINE CO.
CUYAHOGA FALLS, OHIO

vibration to place the concrete uniformly into the forms. Collapsible patented molds of steel are used. The under side and side walls of the shell are reinforced with 16-gauge reinforcing steel spot-welded into a netting on ½-in. centers.

While pouring a mold, portable pneumatic vibrators are applied against the sides of the mold to stimulate a uniform flow of concrete throughout and around the reinforcing.

Cure With Live Steam

The shell remains in the mold long enough to acquire sufficient strength before stripping so that vaults can be safely handled for further treatment. They can be stripped in about six hours. Then they are stippled, if desired, and are handled by an overhead chain hoist into a steam curing kiln. The kiln is a tightly enclosed chamber into which is released a constant supply of live steam. An independent perforated steam pipe is placed inside the shell itself during the steaming cycle to insure uniform treatment. Water is added in the kiln by sprays during this curing which is usually done overnight.

After the steaming cycle is completed, and the vault is still at a high temperature, the shell is plunged into a tank filled with melted asphalt. The molten asphalt not only coats the interior and exterior of the shell but penetrates the shell walls to fill the pores, or voids. Final step in the process is immersion into a special chemical solution.

Concrete made with the carbon aggregate is said to be light in weight and to have an average compressive strength of over 5000 p.s.i. at 28 days. It is claimed by the manufacturer that these vaults are impervious to chemical action of the soil, that they are absolutely air-tight, water-proof and vermin-proof and that they are immune to all chemicals which are known to be destructive to vaults.

Holz Mausoleum Corp., has been manufacturing this vault for two years. Andrew Holz, son of Frank Holz, vice-president and inventor, is president and treasurer of the company.

Build New Plant

STANDARD CONCRETE PIPE CO., Springfield, Ill., has built a new plant. The main building is 80- x 125-ft. with six kilns for steam curing, occupying an additional area 20- x 80-ft. The roof is constructed with Price Bros. patented units, and the walls are made of cinder concrete block. Posts for the room supports are 15-in. concrete pipe on end filled solid with concrete. Block and concrete pipe machinery have skip buckets to place concrete mixtures into overhead feeders.

W. S. Gearheart, owner of the company, is a great believer in diversification. In addition to pipe, his company manufacturers concrete block, well linings, covers, manholes, and tapered tops which are installed in conjunction with sewer pipe. He is also licensee of Price Bros. patent for making floor and roof units.

Concrete House To Cost Less Than Frame

BUILDERS and contractors in many sections of the country expect to construct the all-concrete type of house at a cost comparable with wooden frame construction if the present upward spiral of lumber prices continues. The defense program has caused a sharp increase in lumber prices due to an unprecedented demand for certain sizes used in erecting cantonment buildings on top of a continuing heavy demand for residential construction and limited stocks in yards. This is an excellent opportunity to play up the concrete house, using concrete joists, floor slabs, partitions, and even door and window frames.

Fire in Products Plant

FRANK X. ENDERLE CONCRETE PRODUCTS CO., Los Angeles, Calif., suffered a fire loss of $40,000 when its plant was destroyed. The company manufactures concrete burial vaults and accessories.

•

G. E. KRAUSE, pioneer concrete products manufacturer of Juneau, Alaska, has opened a modern factory in Anchorage, Alaska, for the manufacture of concrete brick and sewer tile. The tile produced will range from 4-in. to 24-in. for sewers, and from 12-in. to 18-in. for culverts.

Low Cost Ready Mix Plant

By RALPH S. TORGERSON

Above: In the background is one of the new ready mixed concrete trucks ready to pull away after receiving a load from the batching plant above. To the rear, below batcher and bins, is space used for a garage. To the right may be seen a truck receiving a load of aggregates from the open retail bins which have wooden quadrant gates

Left: Timber frame ramp on which trucks back up to dump aggregates into bins for ready mixed concrete batching. In the background, to the left, are the retail aggregate bins and railroad switch track with open stockpile on the other side

When the C. J. Horner Co., large building supply dealer in Hot Springs, Ark., decided last year to go into the ready mixed concrete business, a very thorough investigation was made of plants in various parts of the country. R. J. Horner, building material manager, and son of C. J. Horner, head of the company, made a tour of the country to study ready mixed concrete plants, and as a result of this trip and investigation, the present efficient plant layout was decided upon. The entire plant and truck mixer equipment was installed at a very nominal cost.

Reference to the illustrations shows the convenient method of receiving aggregates, and the ease with which concrete mixes are batched and chuted to the mixer trucks. Aggregates are received at the top of the plant by backing trucks up the creosote-timber ramp to hoppers feeding three welded-steel bins, each holding 35 tons. One bin holds washed gravel, another holds bank run river gravel, and the third washed sand. The cost of loading, moving up the ramp and dumping into bins is 10c per cu. yd.

The ramp is 100 ft. long with a rise of 17 ft. from the ground level. No trouble whatever is experienced by the trucks in backing up this grade. There is a gate at the entrance and a fence along each side of the ramp which is protected by two strands of barbed wire to keep out transients. Timber framing members on which the ramp is laid become the structural supports for the bins, batching equipment, scales, and cement storehouse at the other end. Heavy concrete piers support the timbers at this end, however, and cross braces are used to provide greater rigidity.

On the ground level below the ramp and back of the batch loading out chutes is an enclosed area which is used as a storage garage for the two new 1½ cu. yd. T. L. Smith mixer units mounted on 95 hp. Ford cab-over-engine trucks. In addition to the mixer trucks, a number of modern open body trucks are available for aggregate and cement deliveries.

Along one side of the plant and paralleling a railroad switch track are timber storage bins for retail sales of aggregates; one bin holds 80 cu. yd. of washed gravel, another holds 60 cu. yd. of fine Arkansas River sand, and the third, 30 cu. yd. of local river coarse sand. In addition there is an open stockpile along the other side of the track for 350 cu. yd. river gravel for emergency purposes. These materials are unloaded by hand from railroad cars to bins.

Orders for ready mixed concrete and retail sales of cement and aggregates are communicated to the plant operator from the main office about a block away by means of a loud speaker system. Windows in the operator's room give a clear view of incoming and outgoing trucks.

In batching mixer trucks, the operator weighs out aggregates with a Blaw-Knox batcher having a 3-beam scale corresponding to the three aggregates in the bins above and with three levers to release any desired aggregate. Water is first released into the mixer drum from a 75-gal. steel tank which has a glass water level tube calibrated in gallons for accurate measuring and a 2-in. outlet pipe and fast opening valve. Cement is then placed in the mixer drum and is followed by the weighed aggregates. Each mixer truck also has a 16-gal.

MORE PROFITS

LOWER COSTS

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Makes Strong, Dense, Weatherproof Blocks

Economical Electrical Operation

Plain Wooden or Steel Pallets

Mold Boxes Changed in a Few Minutes

CONCRETE TRANSPORT MIXER CO., INC.

660 ROSEDALE AVE. ST. LOUIS, MO.

Produces better blocks with sharp edges and mortar grooves.

A light weight pallet which fits closer to the core box.

Less storage space required.

Lowest investment and maintenance cost.

Commercial PRESTEEL Close Clearance Pallets are more durable because they are formed cold, under pressure increasing their strength.

Write for illustrated catalog.

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YOUNGSTOWN, OHIO.

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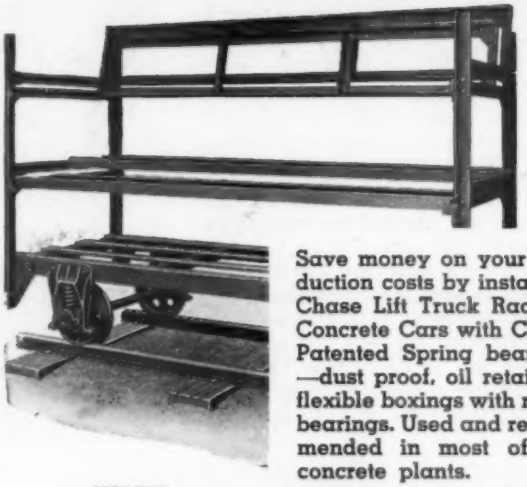
LOW MAINTENANCE COST



Save money on your production costs by installing Chase Lift Truck Rack or Concrete Cars with Chase Patented Spring bearings —dust proof, oil retaining flexible boxings with roller bearings. Used and recommended in most of the concrete plants.

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For Catalog and Special Low Prices

Complete line of concrete block cars, decks, Lift Truck Racks, transfer cars, turntables, dump cars, etc.

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CHASE FOUNDRY & MFG. CO. COLUMBUS, OHIO

SURE CONCRETE BRICK CAN BE MADE WITHOUT PALLETS ON THE

JACKSON CONCRETE BRICK MACHINE

Just Think What This Means in Dollars and cents saved in handling and upkeep as well as the cost of the pallets themselves.

Investigate today the most efficient and up to date concrete brick making equipment on the market.

JACKSON & CHURCH CO.
SAGINAW, MICH.

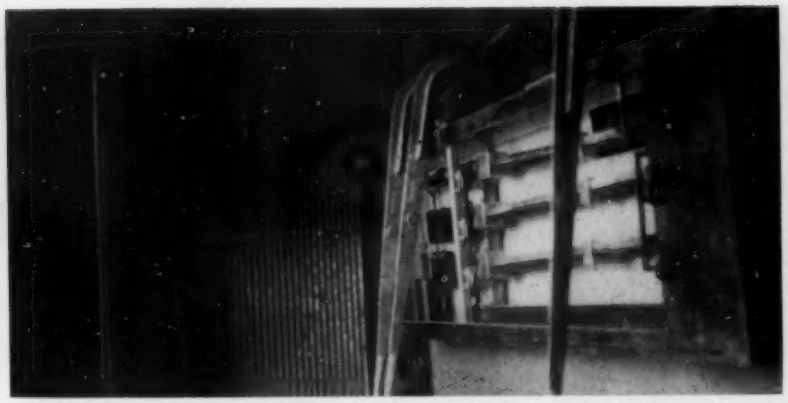
CONCRETE PRODUCTS
Consultation Service

In these pages, month after month, is published the most helpful information obtainable about the manufacture and sale of all kinds of concrete products. If you need further details about any of this material or about concrete products equipment our staff of engineer-editors will be glad to serve you. Producers everywhere are taking advantage of this extra service. Write us about your problems.

ROCK PRODUCTS

309 West Jackson Blvd. Chicago, Ill.

Long chute to handle retail deliveries of cement to truck on the ground level



Three-lever batching equipment, to the right, and water tank with water tube gage calibrated in gallons to assure accuracy in proportioning mixes, to the left

water tank to permit adding water on the job should the contractor desire a wetter mix or to wash out drum at the end of the day. All materials flow by gravity from the aggregate bins into the weigh batcher and then to the mixer truck.

Cement bags are cleaned in a paddle type cleaner, the recovered cement being spouted to a receiving receptacle below. Retail sales of sacked cement are handled to the delivery truck below by means of a trap door in the floor with a chute leading to the truck.

Retail sales of aggregates also are handled by gravity into trucks which back up beneath the bins. An ingenious carpenter made the wooden slide gates for releasing the aggregates. All parts of the gate were made of wood except the galvanized iron wear plate on the sliding gate. A heavy beam lever, working through a toggle joint, operates the quadrant-shaped slide gate.

All concrete is sold to definite strength standards, and buyers know exactly what the quality of the concrete is going to be when delivered.

Concrete Vault Demonstration Attracts Crowd

"SEEING IS BELIEVING" may not always be true, but it is certainly an effective way to promote the sale of concrete products. American Vault Works, Inc., Broadview, Ill., near Chicago recently staged a very successful demonstration of manufacturing methods at their modern concrete burial vault plant which was attended by over 1300 funeral directors and their employes.

The occasion for this demonstration, held in the afternoon and evening for three days, was the introduction of the Continental burial vault, which embodies the Wilbert principle for protection but has a cover of modernistic design.

Guests were conducted through the plant and were shown a display of the three types of vaults made, the Monarch, the Wilbert, and the new Continental. The demonstration also

Subjecting burial vault to load test at demonstration for funeral directors

included all the steps in the manufacture of the vaults, and a tour through part of the research laboratory where chemical and physical tests were made of aggregates, and break tests were made of concrete.

Adhesive qualities of the concrete cast on to the asphalt were demonstrated by two 12-in. square blocks of concrete joined together with a $\frac{3}{8}$-in. layer of asphalt to which hung a case containing 2200 lb. of sacked cement.

A load test was made on a Monarch vault which was 37 days old. A load of 11,049 lb. was placed upon it for one day, and then additional bags of cement were added to the load until 22,449 lb. were reached when a crack developed on each end of the cover. Prizes were given to those who guessed nearest to the final breaking load imposed on the vault.

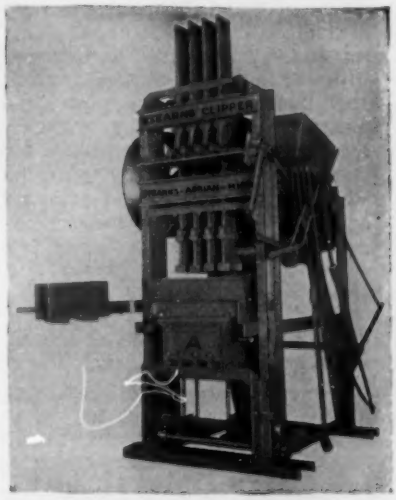
Start Up Ready Mix Plant

READY MIXED CONCRETE CORPORATION, Indianapolis, Ind., started up a new plant at 10th street and Sherman Drive. This is the third plant placed in operation. All plants are equipped with 2-cu. yd. mixers, and the concrete is delivered to the job in transit mixer trucks used as agitators.

Cement Colors

STAR and ANCHOR COLORS

Geo. S. Mepham Corp., East St. Louis, Ill.
C. K. Williams and Co., Easton, Penn.



"ANCHOR"

Complete equipment for making concrete, cinder and other light weight aggregate units, including engineering service for plants and revamping of old ones for more economical service.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns Joltcrete, Stearns mixers, pallets, Straublox Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Blystone mixers and others.

Anchor Concrete Mchy. Co.
G. M. Friel, Mgr. Columbus, O.

Spending Vast Sum On Airports in Defense Program

AIRPORT CONSTRUCTION will be one of the major outlets for crushed stone, sand and gravel, and cement companies during the coming year. The federal government already has appropriated $40,000,000 for the improvement and construction of 225 airports, but this only represents a relatively small part of the complete program. In eight Southern States, the Civil Aeronautics Authority has under consideration the expenditure of nearly $90,000,000 for airports.

Year Round Operation for Some Cement Mills

NATIONAL DEFENSE plant construction requirements will stimulate the demand for portland cement to the extent that some of the leading manufacturers are planning to continue production through the winter for the first time in many years. Volume of business has also been favorably affected as a result of the war by the virtual absence of competition from low cost European cements.

Lime Shipments Up

NATIONAL LIME ASSOCIATION in its monthly summary for August continues to show an upward trend in shipments as compared with the previous month and a year ago. The ratio of shipments to capacity for 72 plants was 54.4 in August, 1940, as compared with 48.4 in August, 1939, and 53.9 in July, 1940. Total tonnage of shipments for 72 companies reporting amounted to 159,576. Shipments for chemical purposes continue to lead by a big margin; 75,881 tons of quicklime and 19 124 tons of hydrate. Companies reporting represent about 51.7 percent of the total capacity of record.

Building New Gravel Plant Replacing Exhausted Pit

SOUTHERN OHIO QUARRIES CO., Columbus, Ohio, owner of the Chillicothe Sand and Gravel Co., Chillicothe, Ohio, has announced that a new gravel plant will be built on North Renick avenue to replace the present nearly exhausted deposit. It is anticipated the new plant will be in operation by November 15. The plant will be a Kerns radial storage system capable of storing 60,000 tons in 15 sizes. In addition to the new plant, a new 2-cu. yd. dragline and other equipment will be installed for handling the sand and gravel.

Officers of the company are: E. H. Davis, president; H. C. Slater, vice-president and secretary; George Quillin, treasurer; George F. Driscoll, sales manager. Plant operations will be in charge of R. S. Lebold and John Wetzel.

Shut Down City Quarry To Buy Locally

THE CITY OF MILWAUKEE, WIS., has suspended operations at its quarry because it has been found cheaper to buy crushed stone from private firms than to operate the quarry, said Walter Swietlik, commissioner of public works, in a recent statement to the Central Board of Purchases. Mayor Zeidler announced that he would ask the city council buildings and grounds committee to study the cost problem to determine whether the closing of the quarry should be a permanent policy.

Cement Profits Up

EIGHT MAJOR CEMENT companies made a net profit of over 13 percent in 1939, or almost double the 1938 profits. The eight companies had a combined profit after all charges of $8,000,000 in 1939 or 13.1 percent of sales as compared with net profits of $4,100,000 or 7.5 percent of sales in 1938. The combined volume of business in 1939 was $61,000,000 as compared with $55,000,000 in 1938.

Illinois Minerals Industries Conference

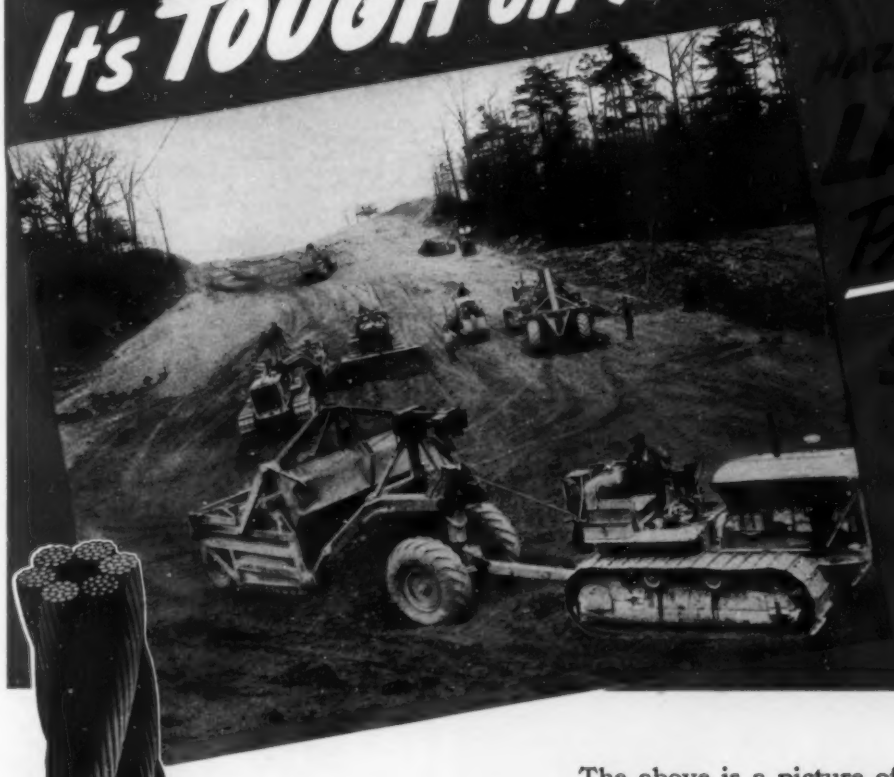
MEETING jointly with the Industrial Minerals Division of the A.I.M.E., and the Institute of Ceramic Engineers, the Illinois Mineral Industries Conference will hold joint sessions on November 14 to 16 at Urbana, Ill. The meetings will be held in the new National Resources Building on the University of Illinois campus which will be dedicated on November 15.

The Rock and Rock Products session will be held Friday, November 15, under the direction of W. R. Sanborn and N. C. Rockwood as chairmen. Topics to be discussed are as follows: Resistance of Chicago Area Dolomites to Freezing and Thawing, by H. B. Willman, associate geologist, Illinois Minerals Division, Illinois Geological Survey; the Virginia Stone Industry, by Arthur Bevan, State Geologist of Virginia; Fundamental Properties of Fine Powders, by B. B. McHan, technical director, Calcium Carbonate Co.; and Calculation of Air Separator Efficiency, by Robt. A. Kinzie, Jr., chief chemist, Santa Cruz Portland Cement Co. Under Clay and Ceramic Products, a subject of interest to the rock wool industry is the paper by J. S. Machin, chemist, Illinois Geological Survey, on "The Effect of Fluorspar on Silicate Melts with Special Reference to Mineral Wool."

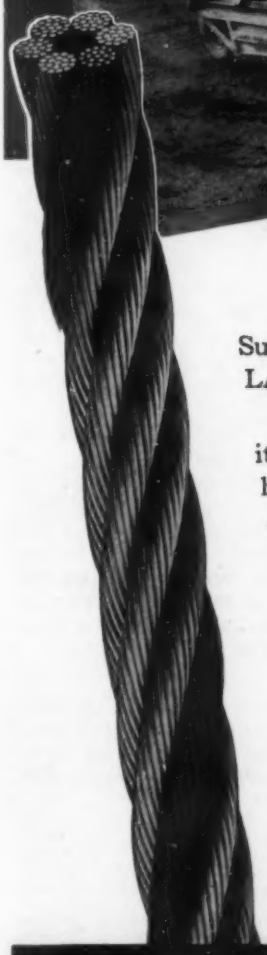
On Saturday, November 16, there will be an inspection trip to the silica sand pit and plant of the Ottawa Silica Co., and the plant of Libby Owens Ford Glass Co., Ottawa, Ill.

The new natural resources building at the University of Illinois, which is to be dedicated November 14 and 15 in conjunction with the Illinois Mineral Industries Conference. In honor of the dedication of the building, the Industrial Minerals Division of the A.I.M.M.E. will also hold its fall meeting in Urbana at this time

It's TOUGH on Wire Rope...



BUT HAZARD LAY-SET Preformed STANDS THE GAFF!



The above is a picture of the Pennsylvania Turnpike in the making. It is also a picture of Hazard LAY-SET Preformed *at work*. Such carryalls and bulldozers are tough on wire rope. That's why Hazard LAY-SET Preformed is a favorite with contractors. It stands the gaff!

And since Hazard LAY-SET Preformed can stand it here—certainly it will give greater dollar value on power shovels, draglines, skip hoists, cement mixers, car retarders and the thousand and one other applications where, actually, the work is easier.

Yes—Hazard LAY-SET Preformed lasts longer. That's because the preforming process eliminates all internal torsional stress; makes the rope flexible, easy to handle. LAY-SET resists kinking and snarling. Broken crown wires don't wicker out to jab workmen's hands. LAY-SET is a safer rope to handle. Specify Hazard LAY-SET Preformed Green Strand for your next line. All Hazard Ropes identified by the Green Strand are made of Improved Plow Steel.

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Green Signifies Full Speed Ahead for National Preparedness.

AMERICAN CHAIN & CABLE COMPANY, Inc.

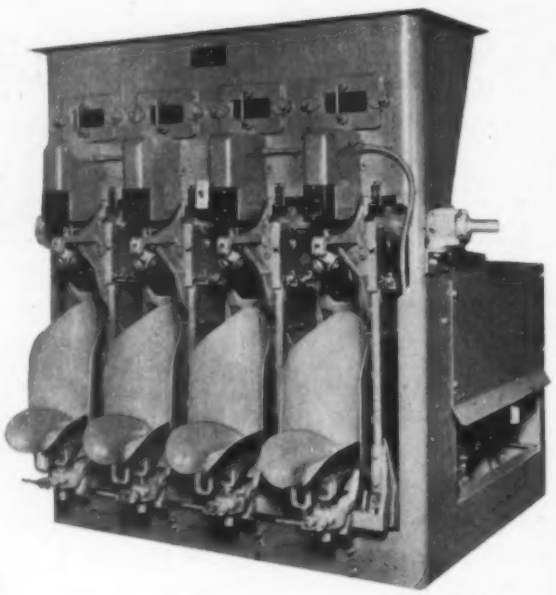
FINANCIAL NOTES

RECENT DIVIDENDS ANNOUNCED

National Gypsum Co., pfd.	$1.12½	Dec. 1
Pacific Portland Cem. Co., pfd. (arrears, Oct. 29, $41.13)	1.00	Oct. 29
Riverside Cem. Co., pfd.	1.50	Nov. 1
Schumacher Wall Board Corp., pfd. (arrears, Nov. 16, $7.50)	2.00	Nov. 15
Superior Portland Cem. Co.	.50	Oct. 28

CONSOLIDATED CEMENT CORP., Chicago, Ill., had a net profit of $118,906 for the nine months to September 30, 1940, as compared with $185,083 for a similar period in 1939. Net sales were $1,182,379 for the nine-month period in 1940 as compared with $1,257,607 in 1939.

THE "MODERN" AUTOMATIC PACKING AND WEIGHING MACHINES



CLEAN PACKAGES are obtained because the discharge of the filled bag is delayed until all excess material from the spout and all excess air from the bag has been evacuated. This delayed period is adjustable for different materials.

AUTOMATIC operation of the packer requires only that the operator place the bag on the filling tube and press the push button. Filling, weighing, evacuation and discharge are then completed without any manual assistance.

ACCEPTANCE AND APPROVAL of the "MODERN" Packer by many of the larger cement manufacturers has been proved by repeat orders.

1. An absolutely clean package.
2. A definitely closer control of weights
3. A distinct saving in labor—less manual operation—easier to operate.
4. Greatly increased CAPACITY—up to 1500 bags per hour with one operator.
5. Elimination of "grief" in packing air tight moisture proof bags.

MODERN VALVE-BAG COMPANY

ALLENTOWN . . . . . PA.

ALPHA PORTLAND CEMENT CO., Easton, Penn., presented to its stockholders the following income account for the 12 months ended September 30, 1940, compared with 1939:

	1940	1939
Net sales	$7,167,639	$7,181,123
Oper. expenses	5,434,318	5,363,067
Depreciation and depletion	955,815	950,781
Operating profit	777,507	867,275
Other income	239,432	116,303
Total income	1,016,938	983,578
Income charges	23,750	39,576
Fed. inc. taxes	214,096	134,232
Net profit	779,093	809,769
Common divs.	639,225	639,500
Surp. for periods	139,868	170,269

•

PENNSYLVANIA GLASS SAND CORP., Lewistown, Penn., has reported a net income of $527,823 for the eight months ended August 31, 1940. This compares with $555,878 net income for the entire year of 1939. Net sales for the first eight months in 1940 were $1,884,253 compared with $2,568,444 for twelve months of 1939.

The glass sand company recently filed a registration statement with SEC covering 31,000 shares of 5 percent cumulative preferred stock, $100 par value. Holders of its outstanding 7 percent cumulative convertible preferred have been offered the right to exchange their stock for the 5 percent stock on the basis of 1-1/5 shares of new stock for each share of 7 percent preferred surrendered. Any stock not so exchanged will be offered publicly by means of interim certificates, which will be sold at a price to be specified later. These certificates provide that if the company, prior to February 2, 1941, determines not to issue the 5 percent stock, it will repay the public offering price, with interest, to the holder of interim receipts.

•

LONE STAR CEMENT CORP., New York, N. Y., reported a net profit of $818,055 for the quarter ended June 30, 1940, as against $923,661 for this period in 1939. Sales were higher, however, the total for the quarter amounting to $5,662,040 in 1940 as against $5,651,288 for the quarter ending June 30, 1939.

•

FLORIDA PORTLAND CEMENT CO., Chicago, Ill., with plant near Tampa, Fla., reported the following nine-months earnings for the period ending September 30, 1940:

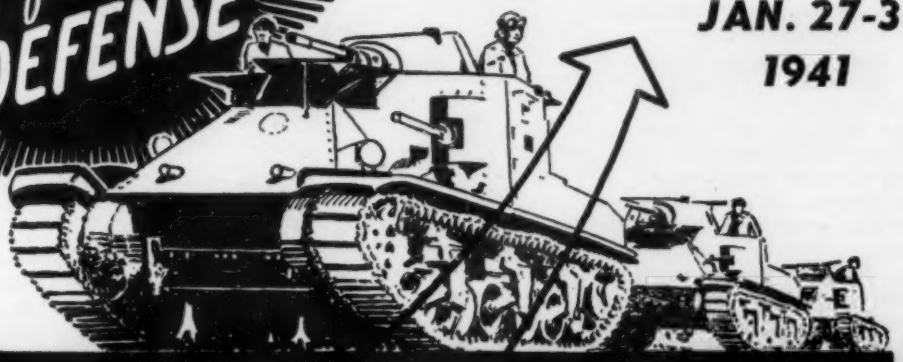
	1940	1939
Net sales	$1,924,610	$1,279,899
Cost of sales	901,773	657,450
Sell., etc., exp.	332,622	218,480
*Net profit:		
Mar. quarter	196,136	111,056
June quarter	214,322	104,366
Sept. quarter	279,758	188,547
9 months	$ 690,216	$ 403,969

*Before Federal income taxes.

ROADS for DEFENSE

38th ANNUAL CONVENTION

JAN. 27-31 1941



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- These and many other topics are going to be discussed by men who have found the answers.
- Learn how to make defense dollars do more work.
- Plan now to be there.

AMERICAN ROAD BUILDERS ASS'N

INTERNATIONAL BUILDING WASHINGTON, D. C.

Sand and Gravel Directors Meet

(Continued from page 54)

A.S.T.M. specifications for asphalt sand, Mr. Walker said very few producers were meeting them.

MR. WALKER said the so-called simplified practice specifications for aggregate sizes had done considerable good in providing a jumping off place toward uniformity in state highway specifications. Producers were objecting to them because the tolerances set up in overlapping sizes were not sufficient to cover plant screening practice. These tolerances, Mr. Walker said, were chiefly important in bituminous work, where the stone and slag industries found ready markets for the excess of certain sizes.

The problems of producers caused by federal government laws, rules, regulations, boards, commissions, taxes, etc., etc., usually covered so interestingly and comprehensively by the executive secretary, V. P. Ahearn, were quite satisfactorily covered by Mr. Walker. Speaking of the competition of W.P.A. plants with commercial producers, he said there really was a policy now which objects to unnecessary competition with commercial producers, but it was difficult to apply, particularly to existing W.P.A. plants.

Effect of Defense Program

The effect of the defense program on the industry was inquired into by going around the table with the following results:

J. L. SHIELY (St. Paul, Minn.) said there was as yet practically little effect. As a contractor it was a different proposition. Defense highways, replacement of bridges, airports, etc., on a national scale, offered a big program. He said it is usual now for contractors on such work to associate themselves with experienced sand and gravel producers to take care of the material requirements.

B. V. HEDRICK (North Carolina) said he was having the largest shipments in the history of his company, a considerable number of these were going into airports and housing projects.

HARRIS N. SNYDER (Buffalo, N. Y.) said little effect of the defense program had yet been felt, although sizeable airport and other projects were contemplated. However, 1941 may not turn out to be as good as 1940 because of cleaning up much W.P.A. work.

EDGAR L. WADE (Baltimore, Md.) said his company had an increase in business in 1940 over 1939, and considerable business was in sight.

JOHN PRINCE (Kansas City, Mo.) said there were no tangible effects from the defense program as yet; in fact it was working the other way by causing a tendency to hold up state highway programs to see what the War Department had in mind.

J. P. EYRE PRICE (Wilkes-Barre, Penn.) said business was about the same as 1939; he had served no defense projects except possibly highways; the outlook was uncertain.

F. P. SPRATLEN, JR. (Denver, Colo.) said his sand and gravel business was less this year than last year, but his ready-mixed concrete business was better. The most encouraging thing about the present situation, he said, was that private capital was coming out of hiding.

DANIEL J. MILLER (Portland, Penn.) said his company had derived no business from defense works and that the future of highway construction in his locality was obscured by the evident plan to use local materials.

OTTO CONRADES (St. Louis, Mo.) said 1940 business for the district as a whole was probably only about half of that in 1939. There were no defense projects as yet.

ANDERSON DANA (New York City) said business was about the same as last year. A proposed dry dock was the only large defense project in sight.

HARRY S. DAVISON (Pittsburgh, Penn.) said business was 25 to 30 percent ahead of last year, largely because of the Pennsylvania Turnpike job. There was no defense program and little business in sight.

ALEX. FOSTER, JR. (Philadelphia, Penn.) said there might be some "real business" in sight; shipments this year were about the same as 1939. There is considerable private plant expansion and a large federal construction program. Next year did not look any too good, however, because of the prospective suspension of the reconstruction of the city sewerage system.

F. C. FULLER, Portsmouth, Ohio, said he had had no results from the defense program; business this year was about the same as last; he didn't know how much W.P.A. work there would be in 1941; might be some more flood prevention construction; state highway work was being held up to see what the military highway program might be.

W. A. BLISS (Pittsburgh, Penn.) said 1940 business was about 25 percent ahead of 1939, probably on account of the Pennsylvania Turnpike job. There is some industrial building and the state highway department seems to know what the military highways to be improved are.

RAY V. WARREN (Pittsburgh, Penn.) said he was optimistic about 1941, because Pittsburgh is such an important industrial center. There is a possibility of the construction of underground storage for oil and ammunition; if so a lot of concrete will be required.

HAL V. OWENS (Utica, N. Y.) said he had had no defense projects; there might be military highways, but the state as a whole was making drastic reduction in its highway program; business in 1940 was about the same as 1939. His crushed stone business was better than his sand and gravel business.

PAUL P. BIRD (Boston, Mass.) said that at the end of nine months his business was 20 percent better than in 1939; but for New England as a whole it was probably about the same. There is some flood prevention work, but in Republican New England, he said, there was not much private capital showing up. Defense projects are not important items in New England but he has a contract to furnish material for a naval flying field in Rhode Island, for which he has built a local plant. Public work has about offset less private construction. He was fairly optimistic on the 1941 outlook.

BRUCE SHOTTON (Carbondale, Penn.), speaking for machinery manufacturers generally, said business was spotty; that some manufacturers might find themselves tied up with war orders.

J. F. BERGER (Trenton, N. J.) said the wire rope business was much better than in 1939, largely because of government orders, but he looked for an increase from private industry as well. The wire cloth business in the sand and gravel field was about the same as 1939. He was optimistic on the future outlook.

J. L. SHIELY (St. Paul, Minn.) said he was already experiencing some difficulties in deliveries of equipment and suggested that producers of ready-mixed concrete consider the possibility of leasing one another's trucks for defense projects.

ALEX. FOSTER, JR. (Philadelphia) thought such a scheme desirable.

STANTON WALKER brought the discussion to a close by emphasizing the market being created for sand and gravel in the construction of airports. He said airport runways when built of asphalt type pavements are always designed to use dense mixtures. For such mixtures, which depend for stability on dense or tight mixes of aggregates, sand and gravel have no drawbacks. It is only for so-called open mixes where stability depends on angularity of the aggregate that gravel is at a disadvantage.

MAXIMUM HAULING . . .

At A Minimum Cost!

At the quarry, where smooth, quick power is a vital factor; the Lima Shay Geared Locomotive is an important production unit. Lima Shays are designed to haul maximum payloads over the toughest grades quickly and economically.

The design of the Shay, with all parts readily accessible, facilitates the job of lubrication, adjustment, or repairs. Investigate the full possibilities of Lima power in your quarry.

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Sales Office: 60 E. 42nd St., New York, N. Y.

Spouts DRY CONCRETE Where You Want It

Saves Time — Reduces Costs — Adds to Profits

Smith-Mobile's high point of discharge enables you to spout the concrete directly into high forms. No waiting for wheelbarrows. No need to push the concrete down the chute. Even DRY concrete can be spouted right into place. And all this can be accomplished without the use of a rear end hoist. Investigate Smith-Mobile's many features...VISIBLE MIXING . . . FEED CHUTE CHARGING . . . CONTROLLED DISCHARGE . . . etc. Write for literature.

THE T. L. SMITH COMPANY, 2885 N. 32nd St., Milwaukee, Wis.

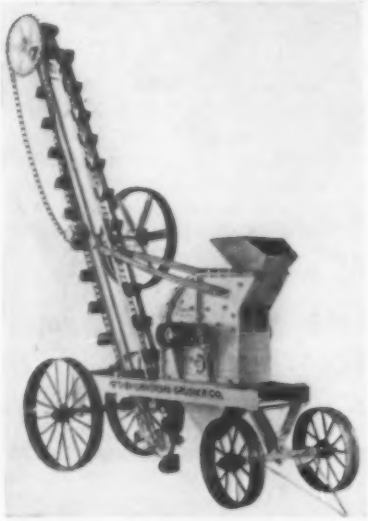
SMITH-MOBILE

The Modern TRUCK MIXER and AGITATOR

NEW MACHINERY • NEW EQUIPMENT

Portable Pulverizer for Agstone

THE UNIVERSAL CRUSHER CO., Cedar Rapids, Iowa, has placed on the market a combined portable pulverizer and bucket elevator unit for limestone quarries that want to produce agricultural limestone for local distribution. It also is available for use in producing road rock and concrete aggregates where the haul is an important factor.



Pulverizer unit designed to produce agricultural limestone for local sales

This portable unit may be obtained with a No. 1, 2, 3 or 4 Universal swing hammer pulverizer which provides 5 to 7, 7 to 12, 8 to 15, or 10 to 20 tons production per hour, respectively. All models feature manganese steel hammers and wear resistant breaker blocks.

Non-Magnetic Steel

JOSEPH T. RYERSON & SON, INC., Chicago, Ill., has announced that Manganal, an austenitic, tough, non-magnetic steel, containing 11 to 13½ percent manganese and 3½ percent nickel, is now carried in stock.

It is said that the 3½ percent nickel content permits Manganal plates to be welded without a subsequent quenching treatment as there is no loss in toughness when it is cooled from the welding temperature. Welding rod of 18-8 stainless composition has been found to give very satisfactory results when used with Manganal.

All the advantages of 11-14 percent manganese steel in resistance to wear and surface work hardening are claimed for Manganal. Thicknesses up to ½-in. can be sheared. It can be flame cut, and requires no subsequent heat treatment when formed or punched hot. Typical applications include: journal boxes, pedestal liners, wear plates, mill liners, shovel buckets, conveyors, crusher hammers, etc.

High Discharge Truck Mixer

CHAIN BELT CO., Milwaukee, Wis., has developed a new line of Rex "Hi-Discharge" truck mixers and agitators for ready mixed concrete. Important features include rear charging, a new mixing principle, and a high discharging point for greater spouting range. It is said that the new mixing principle makes the drum self-cleaning while mixing as the mixing action scours all parts of the drum.

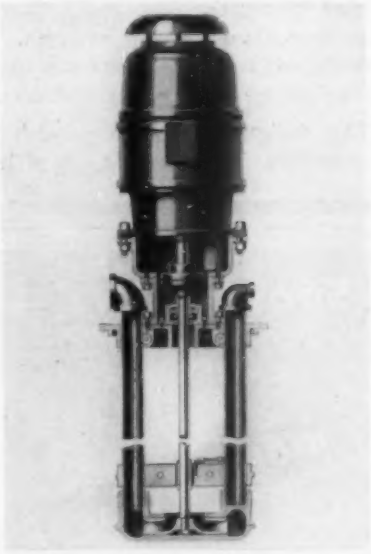
The drum has one opening for both charging and discharging, and uses that entire opening for both purposes. There is a wide rear charging hopper which has a triple function; it serves as a receiving hopper for aggregates while charging, a stationary throw-back blade while mixing, and at the same time affords visibility for sampling the batch.

Another feature is the completely enclosed anti-freeze water system, in which all water lines and valves are protected by the heat of the motor against freezing.

High-discharge truck mixer has long spouting range

Centrifugal Pumps for Abrasive Mixtures

THE AMERICAN MANGANESE STEEL division of The American Brake Shoe and Foundry Co., Chicago Heights, Ill., has designed a line of vertical and horizontal centrifugal pumps for handling all types of abrasive mixtures. Known as the Amsco-Nagle type, the pumps will be available in five different designs, two of which, types A and T, are horizontal, ranging from ¾-in. to 6-in.



Vertical shaft type centrifugal pump

A sectional view of the type SW vertical shaft pump is illustrated. Motor, coupling, thrust bearing and housing are supported by a reinforced plate which serves as a structural member and the strut acts as a conduit for lubricating the lower bearings. An inverted intake was developed to avert gas binding and to utilize the hydraulic thrust to counterbalance the weight of the revolving parts.

DEMPSTER DUMPSTER

THE ORIGINAL BUCKETRUX

Here is Model 300 LF (3 cu. yd. capacity) mounted on 117" wheelbase truck chassis—providing the efficiency of an entire fleet and the costs of a single truck. This powerful unit, like all Dempster-Dumpster units, will handle the Drop-Bottom and Tilt Type buckets (illustrated below) as well as the Skip Type buckets, with equal efficiency. It can also be furnished with a combination cargo and transport body to increase its all-round flexibility. Note the large number of buckets in the background serviced by this one Hoisting Unit. One unit can serve four to ten buckets, depending on the length of haul. Special buckets engineered to meet all conditions.

Investigate—Ask any of the many users—Write us for details of our trial offer.

Exclusive Sales territory available for responsible dealers.

DEMPSTER BROTHERS, Inc.
KNOXVILLE • • • • TENNESSEE

. . . . . What Happens When You Put a

SWINTEK *Screen Nozzle Ladder on Your Pump?*

The screening and digging chain with cutters, insures an even, constant feed of solids to the suction pipe line, carrying oversize and debris back away from the pumping zone. This regularity of flow of solids will materially increase pumping capacity. Dispenses with slug-pumping. Less power is required. Pumping depth limited only by depth of deposit.

Let us show you how your pump capacity will increase from 50 to 100%. Some operators report as high as 300% with no increase in overhead and actual reduction in power costs up to 40%.

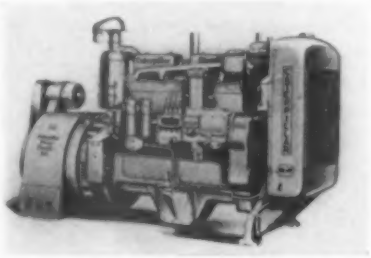
For further particulars write for our descriptive booklet on the EAGLE "SWINTEK" SCREEN NOZZLE LADDER. Also ask for information about EAGLE PADDLE LOG and EAGLE SCREW WASHERS.

EAGLE IRON WORKS *Des Moines, Iowa*

NEW MACHINERY

Diesel-Electric Sets Self-Controlled

CATERPILLAR TRACTOR CO., Peoria, Ill., has announced two models of Diesel-electric sets, the 88-41 and the 77-34. Both units are powered by 4-cyl. Diesel engines. The 88-41 with a bore of 5¾-in. and an 8-in. stroke develops 41 kw. at 900 r.p.m., when equipped with a radiator fan; without the fan, the kw. rating is 44. The 77-34 has a bore and stroke of 5¼- x 8-in., and develops 34-kw. at the same r.p.m. when equipped with a fan. It is rated at 36 kw. without fan. Both ratings are for the polyphase, 60-cycle set.



Easily maintained Diesel-electric set is completely self-controlled

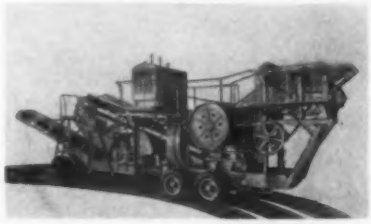
The sets are completely self-controlled, requiring no gadgets other than a circuit breaker. Inbuilt regulation enables the sets to pick up relatively large motor loads with a minimum of light flicker and voltage drop.

There are only three operating adjustments on the engines, and none of these involve the fuel system. Generators are direct-connected, rotating field type, available as 3-phase or single phase, 60-cycle or 50-cycle, and with a wide variety of voltages.

Crusher on Wheels

DIAMOND IRON WORKS, INC., Minneapolis, Minn., is now in production on the portable crushing and screening plant, shown in the illustration. Rock is delivered direct from the quarry shovel dipper to the receiving hopper. A 30-in. x 5-ft. apron feeder with manual control discharges the rock over a grizzly screen, the oversize going to a 15- x 24-in. jaw crusher, and the throughs are bypassed to the belt conveyor passing under the jaw crusher. The jaw crusher also discharges to this belt conveyor. All material is delivered by the rotor-lift which elevates the product to the main conveyor for delivery to the 4- x 8-ft. single deck Diamond vibrating screen.

Sized material passes the screen to the hopper below which feeds the

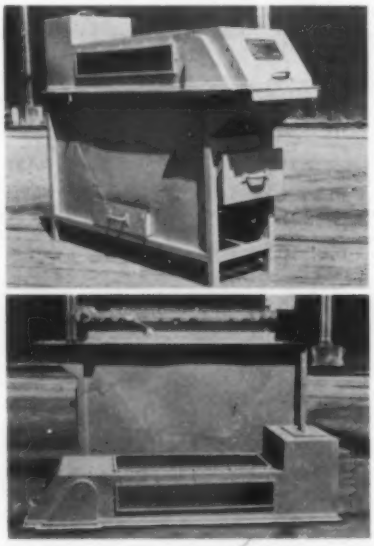


Compact auxiliary portable crushing and screening plant

delivery belt conveyor. Oversize is discharged to a 20- x 26-in. roller crusher, and is carried back by a belt conveyor to the vertical rotor-lift for recirculation over the screen. This plant can be equipped with a double or triple deck screen and chip eliminator if desired. It is driven by a 90- to 100-hp. Diesel engine mounted overhead or from an auxiliary engine.

Laboratory Screen for Close Sizing

NORDBERG MANUFACTURING CO., Milwaukee, Wis., recently built a 11- x 36-in. single-deck screen for the mining school of a large university which will be used for laboratory purposes and a small sampling plant. This screen, which is of unusual design, has a combination stand, casing and bins all forming a part of the screening unit. Details are shown below.



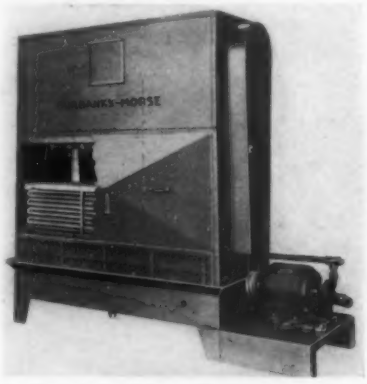
Above: Laboratory screen with cover in place. Below: Cover removed, showing screen mechanism

Drawers have been provided for catching the screened size and the over size, and the cover has glass windows to observe the screening operation. While this is not a screen built regularly or kept in stock, it could be furnished for special applications where a continuous job of screening is required, close sizing is essential, and where only a small capacity is needed.

Jacket Water Cooler for Diesel Engine

FAIRBANKS, MORSE & CO., Chicago, Ill., has designed a Diesel engine jacket water cooler, using the principle of heat dissipation by evaporation of water, which is said to operate at low cost.

It consists essentially of a coil through which the jacket water is



Cooler uses principle of heat dissipation by evaporation of water

passed, nozzles to spray water on the coil, and a blower to force air past the coils. In operation, the hot jacket water enters the cooling coil at the top of the cooler, water from another source is sprayed over the coil from one end and air is blown in from the other end. As the water outside the coil evaporates, it cools the coil and the jacket water which is then returned to the engine. The sprayed water is constantly recirculated so that the actual amount consumed is only about 2 lb. per 1000 B.t.u. of engine heat absorbed.

The cooling coil is fabricated of ⅝-in. OD hard drawn copper tube, hot-tinned dipped. All coils are tested to 1000 lb. pressure. The cooler is designed primarily for indoor operation although units for outdoor installation may be secured with cooling coils of the finned type to permit air cooled operation through the winter season.

Finned type coolers may also be used indoors in the winter season to heat occupied spaces through branch lines of the air discharge duct.

HEAVY DUTY CRUSHERS Reduce in ONE OPERATION

Jeffrey Heavy Duty Hammer Crushers reduce steam shovel size limestone shale in ONE OPERATION to 1½" and under suitable for storage and for blending as feed to raw grinding mills as in Cement Mill operations. One Jeffrey Crusher will do the work of several primary crushers of other makes. Write for literature.

REDUCTION DIVISION

THE JEFFREY MANUFACTURING COMPANY

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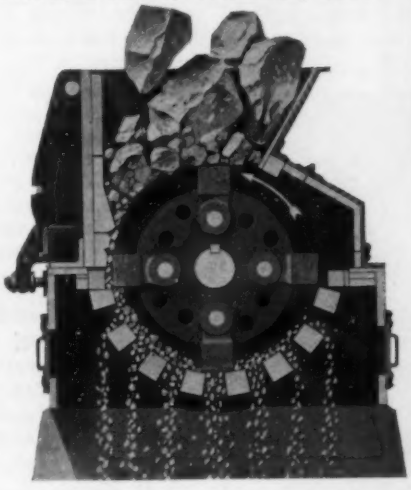

All parts on Jeffrey Heavy Duty Hammer Crushers are extra heavy and rugged to withstand severe and continuous service. Equipped with oversize slugger hammers and furnished with either heavy cast iron or Armorplate steel frames with manganese steel liners.

THE PRICE *of Leadership!*

ROCK PRODUCTS leads the field in editorial excellence and prestige. It is the journal referred to by all authorities for authentic information about these industries.

ROCK PRODUCTS has paid the price of leadership. It has had only one fundamental editorial policy through the years: Its editorial policy has been, in one word, USEFULNESS to the reader.

ROCK PRODUCTS has never reduced its subscription price because it has never reduced its usefulness to the reader: and no reader has ever objected to paying $2 for this useful journal.

ROCK PRODUCTS

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Chicago, Ill.

A 31 lb. package of Amazing Performance

NEW GARDNER-DENVER S-33 SINKER

HERE'S another Gardner-Denver Sinking Drill achievement that brings new flexibility—new usefulness to the quarry field. Weighing only 31 lbs., the new Gardner-Denver Model S-33 Sinking Drill has speed, power and reliability that lift it far above its weight class.

Because of its light weight, the S-33 is easy to carry in the hard-to-reach places—easy to hold in any position for plugging, chute-blasting, hitch-cutting, or block-holing. Because of its amazing power and speed, it can be compared only with much larger drills in performance.

Among the S-33's outstanding features are 4-pawl rotation (instead of the usual 2-pawl)—simplified and improved valve design—exceptionally large striking area of piston hammers—easy control—quick and efficient cleaning.

Get the whole story about the S-33—and why it will mean greater progress on *your* quarry jobs. We will gladly send Bulletin on request. Write Gardner-Denver Company, Quincy, Illinois.

GARDNER-DENVER

SINCE 1859

Largest Single Sale of Crushed Stone for Defense Program

FLORIDA stone companies are busy getting out crushed stone to fill what is said to be the largest single order ever placed in the State. The order which was placed with the Limerock Association, Inc., amounts to 540,000 tons or about 10,000 carloads, and production is now moving at the rate of 75 cars a day.

In addition, the Association recently completed a deal with the federal government for delivery of 150,000 tons for the construction of streets at Camp Blanding, National Guard and Army training camp near Keystone Heights, Fla. Sales of crushed stone during 1940 have been the highest in five years, according to a statement by Leon B. Thrasher, engineer-director for the Limerock Association, Inc.

Of the 540,000 tons of crushed stone sold to the Navy, 340,000 tons will go to the Jacksonville base and 200,000 to the auxiliary base at Green Cove Springs. Rock for Jacksonville will be quarried at Newberry and for Green Cove Springs will be taken from quarries at Kendrick and Reddick, Fla. Material for Camp Blanding will be obtained from quarries at Williston, Fla.

May Extend Turnpike

PENNSYLVANIA TURNPIKE officials are working on plans to extend the superhighway eastward to Philadelphia. A demonstration was recently held for the benefit of Army officials to show the effectiveness of the highway in moving heavy army trucks and anti-aircraft units. The absence of poles on either side of the roadway makes it possible to land airplanes on the concrete pavement.

It has been estimated that gross receipts of $2,670,000 will be obtained from 1,300,000 vehicles the first year of operation. By the tenth year, it is expected that $4,432,000 will be paid annually by 3,000,000 cars and trucks.

Buffalo Cement Plants Going Strong

CEMENT PLANTS in the Buffalo, N. Y., area are planning to operate their kilns through the winter months for the first time in many years. Production is the highest that it has been for 10 years. The defense program and the mounting volume of industrial construction have been responsible for this increase. The Great Lakes Portland Cement Corp. has been operating three of its four kilns continuously for the past two months, producing about 4500 bbl. a day. Some of the clinker produced is being shipped to Cleveland, Ohio, for storage to be finished later. The Federal Portland Cement Co., Inc., has been producing 1600 bbl. a day since March. About 15,000 bbl. of cement will be required for the new Cargill grain elevator in Buffalo, and new aircraft plants in this area will require a large amount of cement for foundations and floorings.

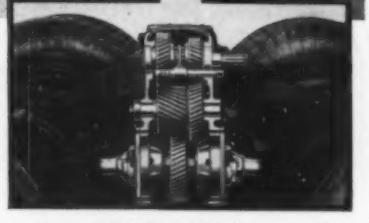
New Sand Concern

THE LENAWEE SAND AND GRAVEL CO., Adrian, Mich., was sold recently to new owners who have made improvements, looking to early operation of the pit. Fred J. Westlow will be superintendent. It is expected operation will commence about November 1.

Quarry Fire

SAMUEL M. YODER ESTATES stone crushing plant at Blooming Glen, Penn., had a fire recently which broke out in the asphalt heating buildings used for the preparation of road mixes. Damage of approximately $3000 resulted from the blaze.

HERE'S WHERE THE WORK IS DONE!



TRACTION . . . NOT POWER ALONE IS WHAT YOU NEED

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When there's heavy work to do, TWO driving axles under the load are better than one. Use the

THORNTON FOUR-REAR-WHEEL DRIVE

YOU SAVE MONEY!

Take a truck of 1½ to 3-tons original capacity and let us quickly and at low cost convert it to a husky unit of 30,000 lbs. or more gross vehicle weight capacity.

Two ratios, for power and speed, easily controlled by a lever in the cab. Walking-Beam Flexibility—Special spring construction keeps equal load on all four driving wheels—Perfect balance between power and weight.

THORNTON TANDEM CO.
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Manufacturers also of the THORNTON automatic-locking DIFFERENTIAL which gives traction when slippery going makes trucks equipped with ordinary differentials helpless.

"When you need TRACTION you need THORNTON"

SEND FOR A COPY!

Just off the press . . . a new, completely revised edition of the well-known Hendrick handbook, "Perforated Plate for Vibrating and Shaking Screens." Complete with application photos, drawings of perforations, tables of sizes, gauges, open areas, weight per square foot, etc.

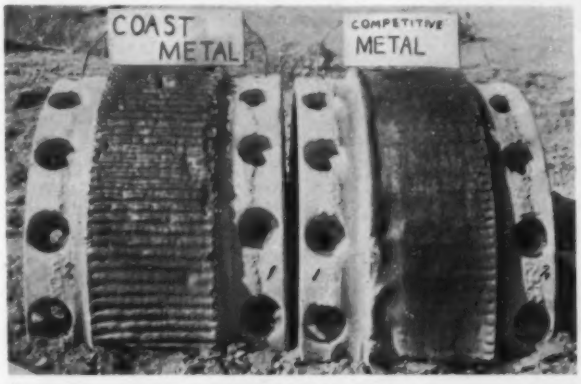
Write on your letterhead for a copy of this useful handbook.

HENDRICK MANUFACTURING CO.

47 Dundaff St., Carbondale, Pa.

SALES OFFICES IN PRINCIPAL CITIES
PLEASE CONSULT TELEPHONE DIRECTORY

Makers of Elevator Buckets of all types, Mitco Open Steel Flooring, Mitco Shur-Site Treads and Mitco Armorgrids. Light and Heavy Steel Plate Construction.



★ Look how much more service you get with COAST METALS ★

A prominent eastern cement company coated these two halves of a hot clinker roll with a hard surfacing material, the one on the left with COAST METAL, the one on the right with a competitive brand. Note particularly comparison of wear by card edge on top acting as straight edge. The half coated with COAST METAL shows practically no wear, while the other is worn out.

This is a typical application where exceptionally severe abrasion is encountered and where the use of COAST METALS reduces operating costs by giving increased life and greater efficiency.

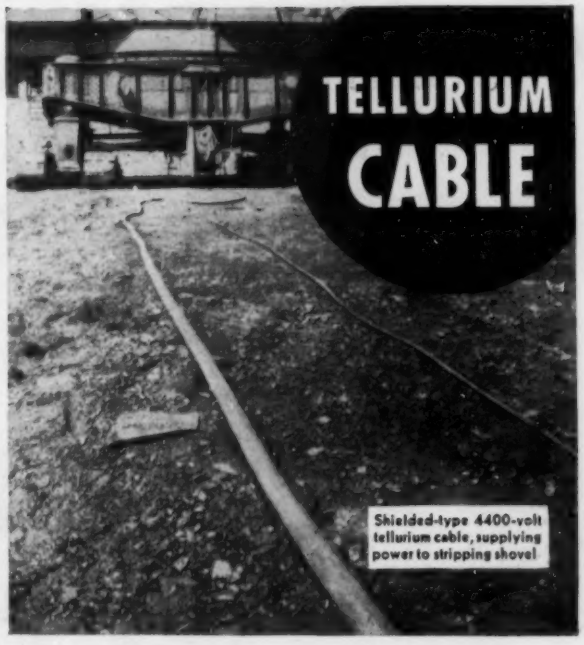
COAST METALS are noted for their ability to withstand abrasion, shocks and high temperature. They are easy to apply by either the oxy-acetylene torch or the electric arc.

Write today for complete details.

COAST METALS, INC.

CANTON, OHIO

Watsonville, Calif. . 117 Liberty St., New York City



One Company a Steady User for 8 YEARS

EIGHT years ago we supplied an Indiana colliery* with some tellurium-rubber cable for electric shovels. Its performance over a long period proved its toughness. As a result, that coal-mining company has been using tellurium cable ever since. Many other mine owners have also discovered that tellurium cable saves money by cutting down on replacements, repairs, and costly holdups.

In detail this cable has been improved through the years, but essentially the design is one that has always given satisfactory service. It's tough, hard to cut, and stands up under rough usage.

Next time you need portable electric cable for shovels, cutters, loaders, drills, or motors, use tellurium-rubber and save money. Most sizes can be supplied by your jobber from stock. Or, to make absolutely sure of the right type and size for your particular job, call a cable specialist at the nearest G-E Office. General Electric Company, Schenectady, N. Y.

**Name on request*

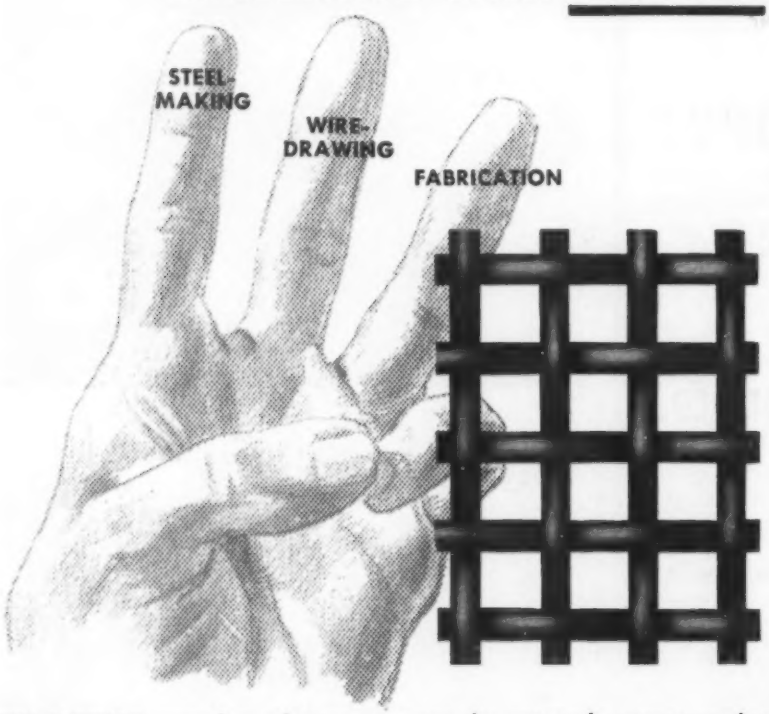
GENERAL ELECTRIC INSULATED CABLE
ALWAYS THE RIGHT TYPE FOR EACH JOB

GENERAL ELECTRIC

UNDER ONE CONTROL

FOR ONE PURPOSE

—SCREENING THAT *ENDURES*



IN BUYING screening, what you look for is endurance. And in Screening, endurance begins with steel... steel that can be drawn into the toughest, strongest and most abrasion-resistant wire possible.

Ordinary steels won't do. That's why Roebling makes every pound of steel that goes into Roebling Screening. This steel is made in small "heats", in special small open-hearth furnaces. Because only in that way can the exact characteristics required be developed under sufficiently close control.

In other words, the steel used by Roebling is actually custom-made to meet the extremely severe requirements of good screening service. So, too, with every step in the wire-drawing—and the fabrication of the screening itself. It's all done by Roebling—under *one* control, for *one* purpose—to make Roebling Screening outstanding, wherever used, as the screening that *endures*.

You can obtain Roebling Wire Screenings for every sizing, cleaning and grading service. We invite your inquiry for any of the various types and metals.

JOHN A. ROEBLING'S SONS CO.
TRENTON, N.J. *Branches in Principal Cities*

ROEBLING ABRASO SCREEN

TRADE JERSEY MARK

NEARLY 100 YEARS OF WIRE FABRICATING SPELL THE DIFFERENCE

Substitute Producer Gas for Natural Gas

GYPSUM, LIME AND ALABASTINE, CANADA, LTD., Toronto, Ont., is converting its two new vertical shaft, gas-fired kilns at the Beachville, Ont., lime plant from natural gas to producer gas and adding a new kiln. The plant was designed by Victor J. Azbe, consulting engineer, and built under the supervision of J. H. Robinson, general superintendent, in winter of 1939. Descriptions were published in ROCK PRODUCTS, July, 1939, and October, 1939. A single R. D. Wood & Co. gas producer is being installed to serve all three kilns.

Sales and profits of Gypsum, Lime & Alabastine for the first 10 months of the year are well ahead of the corresponding period of last year, according to a statement appearing in *The Financial Post*, Toronto. Net profit last year was more than double that of 1938. The increased lime producing capacity has been made necessary by heavy demand from paper, steel, and chemical industries.

Sand-Lime Brick Production and Shipments

SEVEN active sand-lime brick plants reporting for September and nine reporting for August, statistics for which were published in October.

AVERAGE PRICE FOR SEPTEMBER

	Plant Price	Delivered Price
Grand Rapids, Mich....		$14.00
Milwaukee, Wis.	$10.00	12.00
Seattle, Wash.	14.50	16.50
Syracuse, N. Y.....	14.00	16.00C/L 20.00L/C

STATISTICS FOR AUGUST AND SEPTEMBER

	†August	‡September
Production	2,820,860	1,624,645
Shipments (rail)	257,500	82,000
Shipments (truck) ..	3,259,942	1,913,031
Stock on hand.....	1,059,984	776,855
Unfilled orders	2,793,944	775,000

† Nine plants reporting: incomplete, one not reporting production, three not reporting stock on hand, and three not reporting unfilled orders.

‡ Seven plants reporting: incomplete, one not reporting production, two not reporting stock on hand and three not reporting unfilled orders.

Concrete Pavement Yardage

AWARDS of concrete pavement for September, 1940, have been announced by the Portland Cement Association as follows:

	Square yards awarded during September	first 9 months
Roads	3,169,680	29,718,756
Streets & Alleys....	1,574,167	12,754,950
Airports	1,044,606	3,080,687
Totals.....	5,788,453	45,554,393

Traffic and Transportation

PROPOSED RATE CHANGES—The following are the latest proposed changes in freight rates up to and including the week of October 12:

Central

63213 (2). **Filter sand and gravel** (See Note 3), establish on, from Jackson, O., to Wheelwright, Ky., rate of 187c per net ton—Buckland Scale.

63394. **Roofing granules**, C. L., min. wt. 60,000 lb. Establish on from Danville, Ill., to Baltimore, Md., 533c; Rutherford, N. J., 581c; E. Walpole, Mass., 613c; Edge Moor, Del., 549c; Edgewater, N. J., 581c; Elizabeth, N. J., 581c; Fulton, N. Y., 466c; Jersey City, N. J., 581c; Kearny, N. J., 581c; Manville, N. J., 581c; Millis, Mass., 613c; Philadelphia, Penn., 549c; S. Bound Brook, N. J., 581c; York, Penn., 533c per net ton.

63417. **Slag** (product of iron or steel, blast or open hearth furnaces), crushed or screenings (other than granulated or expanded), in open top cars, C. L. Establish rate of 138c net ton from Ironton to New Lexington, O.

63434. **Industrial sand**, as per usual descriptions (a), (b) and (c). Establish on, from M. & S. Valleys Group to Cato, N. Y. (a) 264c; (b) 290c; (c) 264c per net ton.

63448. **Limestone**, ground or pulverized, or **limestone dust**, unburnt, in box cars, in straight or mixed C. L., min. wt. 60,000 lb. Establish on, to destinations in Indiana, rates as follows: Rates, (1) From Bloomington, Ind. (2) From Bedford, Ind. to Frankfort (1) 138, (2) 143; Anderson (1) 138, (2) 143; Muncie (1) 138, (2) 149; Terre Haute (1) 127, (2) 132; Greencastle (1) 99, (2) 110; Indianapolis (1) 105, (2) 132; Shelbyville (1) 116, (2) 127; Connersville (1) 138, (2) 138; Greensburg (1) 127, (2) 127; Lawrenceburg (1) 143, (2) 138; New Albany (1) 127, (2) 116; Evansville (1) 143, (2) 138; Washington (1) 121, (2) 116; Vincennes (1) 127, (2) 127; Midland (1) 110, (2) 105; Michigan City (1) 165, (2) 171; Mishawaka (1) 176, (2) 162; Goshen (1) 176, (2) 182; Kendallville (1) 176, (2) 182; Plymouth (1) 165, (2) 176; Ft. Wayne (1) 165, (2) 176; Logansport (1) 149, (2) 160; Attica (1) 138, (2) 149; LaFayette (1) 132, (2) 138; Crawfordsville (1) 116, (2) 127.

63449 (1). (a) **Sand** (except industrial), and **gravel**, in open top equipment, C. L. (See Note 6), (b) **Sand**, industrial, C. L., **sand** (except naturally bonded moulding; ground or pulverized sand), and **gravel**, in closed equipment, C. L. Establish on, from Chardon, O., to Midland, Penn., (a) 132c; (b) 154c per net ton.

63451. **Limestone, agricultural and screenings, agricultural limestone**, unburned, in bulk, in open-top cars only, C. L. Establish on, from McVittys, O., to Findlay, O., 88c per net ton.

63469. (a) **Sand** (other than industrial); **sand**, industrial, in open top or closed cars, C. L. (will not apply on sand processed beyond washing or screening for decolorizing, filtering or water softening). Establish on, from Allegany, Carrollton, Irvine Mills, Limestone, Olean and Vandalia, N. Y., to Crawfordsville, Ind., 341c per net ton.

63471. **Industrial sand** as per usual descriptions (a), (b) and (c). Establish on, from Evansville, Ind., group. Proposed rates (in cents per net ton): To McKeesport, Penn. (a) 352, (b) 387, (c) 352; Philadelphia, Penn. (a) 440, (b) 484, (c) 440.

63540. **Limestone**, ground or pulverized, unburnt, C. L., min. wt. 60,000 lb. Establish on, from producing pts. in western Penn. and western N. Y. to destinations in western Penn. and western N. Y., rates on basis of the I. C. C. Dkt. 25220 Carriers' Revised Scale, representative of which are: From Buffalo, N. Y., to N. Y. pts., viz.: Little Valley, 127c; Dunkirk, 121c; Red House, 138c; Randolph, 132c; Kennedy, 138c; Falconer, Bonita, Bemus Point, 143c; Nixon, 132c; Westfield, 127c; Brocton, Van Buren, 121c; Fredonia, 127c net ton.

63556. **Sand and gravel**, C. L. Establish on, from Chardon, O., to pts. in Canada, rates to apply only via Buffalo, N. Y., gateway. ("A" refers to sand (except industrial) and gravel in open top equipment (See Note 6); and "B" refers to sand and gravel in closed top equipment.) To: Brantford, Ont. A 325, B 347; Galt, Ont. A 325, B 347; Guelph, Ont. A 352, B 374; Hamilton, Ont. A 325, B 347; Joliette, Que. A 605, B 627; Kingston, Ont. A 479, B 501; Kitchener, Ont. A 352, B 374; London, Ont. A 325, B 347; Montreal, Que. A 534, B 556; Niagara Falls, Ont. A 242, B 264; Orillia, Ont. A 479, B 501; Oshawa, Ont. A 424, B 446; Ottawa, Ont. A 534, B 556; Owen Sound, Ont. A 479, B 501; St. Catherines, Ont. A 286, B 308; St. Thomas, Ont. A 325, B 347; Sorel, Que. A 688, B 710; Thorold, Ont. A 286, B 308; Toronto, Ont. A 369, B 391; Welland, Ont. A 286, B 308.

63582. **Sand** (except industrial) and **gravel**, C. L., in open top cars. Establish on from Irving, N. Y., to Horseheads, N. Y., 165c per net ton, via N. Y. C. (W.) Buffalo, thence D. L. & W. or L. V.

63583. **Sand**, C. L. Establish on, from Mentor, Ky., to Cincinnati, O., 50c.

63599. (a) **Sand** (except industrial), and **gravel**, in open top equipment, C. L. (See Note 7); (b) **sand**, industrial, C.

Note 1—Minimum weight marked capacity of car.

Note 2—Minimum weight 90% of marked capacity of car.

Note 3—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

Note 4—Reason. No present or prospective movement.

Note 5—Reason: Comparable with rates from other origins in immediate vicinity.

Note 6—Rates will not apply on shipments in cars with tarpaulin or other protective covering. In such instances the rates applicable on shipments in box cars are to be assessed.
modity shipped, the shipper to so certify on shipping order or bill of lading.

Note 7—The oil, tar or asphaltum not to exceed 10% of weight of the commodity shipped, the shipper to so certify on shipping order or bill of lading.

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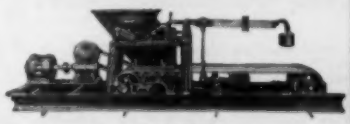

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L.; **sand** (except industrial), in all kinds of equipment, C. L.; **sand** (except industrial), and **gravel**, in closed equipment, C. L. Establish on, from Chardon, O., to Cato, N. Y., (a) 253c and (b) 279c per net ton.

63633. **Slag** (a product of iron or steel furnaces) in bulk, in open top cars, C. L. Establish on, from E. Jordan, Mich., to Alexandria and Richmond, Ind., 204c; from Elk Rapids, Mich., to Alexandria, 198c, and Richmond, Ind., 192c per net ton.

63598. **Industrial sand**, as per usual descriptions (a), (b) and (c). Establish on, from Evansville, Ind., Group:

To	(a)	(b)	(c)
Wilmington, O.	242	266	237
Geneva, O.	341	373	341
Rochester, N. Y.....	393	436	396
Syracuse, N. Y.....	418	460	418

63704. **Industrial sand**, as per usual Descriptions (a), (b) and (c)—Establish on, from Ottawa, Ill., district to Owosso, Mich., (a) 252c; (b) 275c and (c) 253c per net ton.

63709. **Agricultural limestone**, unburnt, in bulk, in open top cars; **agricultural limestone screenings**, when loaded in open top equipment, C. L. Establish on, from Sandusky, O., to Strasburg, Parall, O., 116c; Dover, New Philadelphia, Uhrichsville, O., 127c per net ton, via B. & O. R. R. direct.

63710. **Agricultural limestone**, unburnt, in bulk in open top cars, C. L., min. weight. Establish on, from Piqua, O., to Cumberland, O., 160c per net ton.

63763. **Sand**, all kinds, and **gravel**, C. L. Establish on, from Glass Rock, O., to Fredericksburg, O., 110c in open top cars and 127c per net ton in box cars, via N. Y. C. (W)—Zanesville, O.-P. R. R.

63728. **Sand** (industrial) or **gravel**, in open top cars, without tarpaulin or other protective covering, C. L. Establish on, from Wells Pit, W. Va., to Belmont, Bethesda and Barnesville, O., 88c per net ton, via B. & O. R. R. direct.

63825. **Dolomite, roasted** (refractory dolomite in granular form, treated or untreated clinker or burned to a dead state), C. L. Establish on, to Fairfield, Ensley, North Birmingham, and Thomas, Ala., from Durbin, O., 499c; Bettsville, Maple Grove, Martins, Millersville, Narlo and Woodville, O., 537c per net ton.

63834. **Limestone**, unburnt, ground or pulverized, C. L., min. wt. 60,000 lbs. Establish on, from Northwestern Ohio Group 1 origins, viz.: Carey, Genoa, Gibsonburg, Luckey, Maple Grove, Marblehead, Martin, McVitty's, Narlo and Woodville, to Helvetia Mines and Lucerne Mines, Pa., 259c per net ton.

63852. **Sand** (except industrial) and **gravel**, in open top cars. Establish on, from Hamilton, O., to Charleston, Ind., 127c per net ton, via B. & O. R. R. direct.

63854. **Stone, crushed**, in bulk, in open top cars. Establish on, from Speed, Ind., to Charlestown, Ind., 83c per net ton.

Trunk

Sup. 4 to 38963 (shippers). **Limestone**, crude fluxing, foundry and furnace, C. L. (See Note 3), from Inwood, W. Va., to Trenton, Roebling, Florence and Burlington, N. J., $2.08 per gross ton.

38995 (Sup. 3). **Natural stone, viz., chips or granules (roofing granules)**, C. L., min. wt. 50,000 lb., to Northfield, Ill., from Rutherford, N. J., $4.95 and from Esmont and Dutch Gap, Va., $4.73 per net ton.

39101. **Lime**, common, hydrated, quick or slaked, C. L., min. wt. 30,000 lb. and 50,000 lb., and **Mortar**, dry building, C. L., min. wt. 30,000 lb., from Martinsburg, W. Va., and other points taking Group E, per Item 5095 of Agent Curlett's I. C. C. No. A-666. Proposed rates to ("A" refers to lime and mortar, min., 30,000 lb. and "B" to lime, min., 50,000 lb.)—New Albany, Ind., A 473, B 374; Jeffersonville, Ind., A 473, B 374; Indianapolis, Ind., A 462, B 374; Chicago, Ill., A 506, B 407; Chicago Heights, Ill., A 506, B 407. In cents per 2000 lb. in lieu of current 6th class rates (See Note 5).

39104. **Slate**, crushed or ground, C. L., also **stone chips** or **granules** (roofing granules), C. L., min. wt. 50,000 lb., from Dutch Gap and Esmont, Va., to Cold Brook, N. B., 48c; Danville, Que., 38c; Montreal, Que., 36c; Montreal, Que. (Place Viger), 36c; Portneuf, Que., 39c St. John, N. B., 48c (See Note 5).

39120 (increase). Cancel commodity rate of 19c per 100 lb. on **limestone, crude or crushed**, C. L., from Baltimore, Md., to Niagara Frontier and adjacent territory as published in Item 1230 of W. Md. Ry. Tariff I. C. C. No. 8635 (See Note 4).

39132. **Ground or pulverized limestone**, C. L., min. wt. 60,000 lbs., from Oriskany Falls, N. Y., to Lake Placid, N. Y., $1.93 per net ton, in lieu of current sixth class rate of $4.20 per net ton. (See Note 5.)

39158. **Sand** (other than industrial), in closed cars, and **sand**, industrial, in open top or closed cars, C. L. (See Note 3), from P. R. S. L. stations, Belleplain, Cape May, Clayville, Dorchester, Downer, Folsom, Grenloch, Manumuskin, Menantico, Palmero, Millville, Mt. Pleasant, Muskee Siding, Richland, Sea Isle Jct., South Vineland, Tuckahoe, Williamstown Jct., and Woodbine, N. J., to Montreal, Que., $4.62 per net ton, in lieu of current rate of $4.95 per net ton. (See Note 5.)

39168. **Slag**, crushed (not granulated), the product of iron or steel furnaces (See Note 3), from Pittsburgh, Penn., and Bessemer, Penn., to Buffalo, N. Y., 187c per net ton (See Note 5).

39190. **Sand** (other than industrial) and **gravel** in open top cars without tarpaulin or other protective covering, C.

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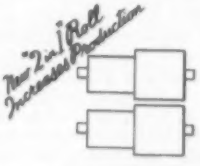

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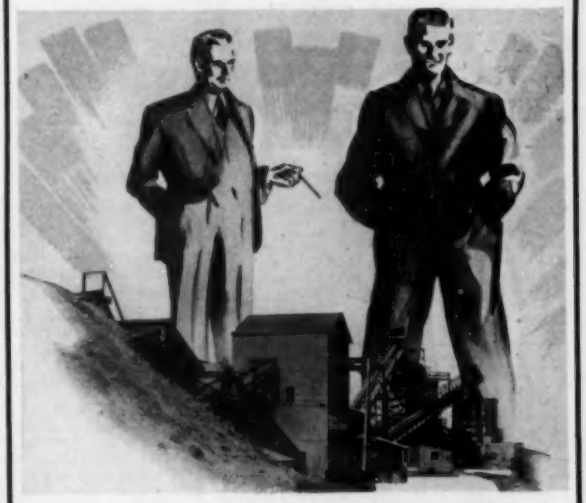

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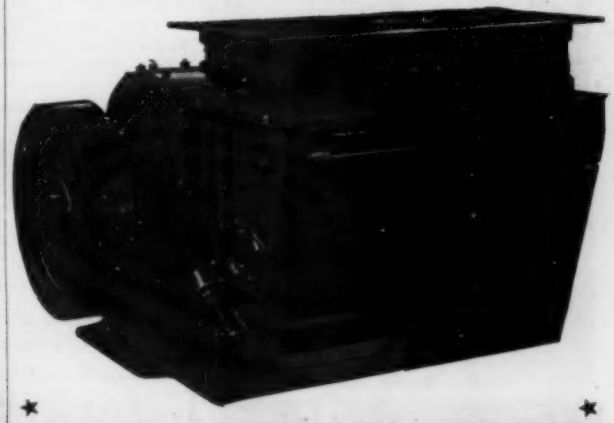

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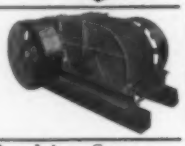
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L. (See Note 3), from Bethlehem, Penn., to Pen Argyl, Penn., 110c per net ton in lieu of current sixth class rate of 11c per 100 lb.

39230. **Roasted Dolomite**, C. L. (See Note 3), from Millville, W. Va., to Newport News, Va., 240c per net ton in lieu of current 6th class rate of 25c per 100 lb.

Illinois

IRC-4231-5. **Dolomite**, roasted or burnt, C. L. Establish rate of 124c per ton of 2000 lb. from Chicago, Ill., to Sterling, Ill. Min. wt. 90 percent of Sterling, Ill. (See Note 3), but not less than 60,000 lb.

IRC 5933-A. **Lime rock**, limestone or chats, broken, crushed or ground, straight or mixed C. L., Mosher and Ste. Genevieve, Mo., to Peoria, Ill. Present, 226c net ton. Proposed, 176c net ton.

IRC 7497-24. **Agricultural limestone** (unburned), C. L. (See Note 3), from Alton, Ill., to Butler, Hillsboro, Irving, Witt, Nokomis, Ohlman, Rosamond, Pana, Tower Hill and Selbyville, Ill. Present, various. Proposed, 77c net ton, to apply only on Illinois intrastate traffic.

IRC 8414-2. **Sand** (except industrial), in open top equipment, C. L. (See Note 3), but orders will not be accepted for open top cars of less marked capacity than 80,000 lb., from Essex, Ill., to Moline, East Moline, Rock Island, Ill., and Davenport, Ia. Present—$1.43 net ton. Proposed—$1.40 net ton.

IRC 9131-1. **Stone, crushed or ground**; chatt, rip rap and rubble in open top cars, C. L., from E. St. Louis and Falling Springs, Ill., to Auburn, Beechley, Cimic, Pawnee, Sicily, Humphrey, Kincaid and Callaway, Ill. Present—Class. Proposed—99c net ton.

Southern

23117. **Sand**, C. L. Establish 65c net ton. Gaillard, Ga., to McDonough, Ga.

23120. **Crushed stone**, C. L. Establish 135c net ton. Lithonia, Ga., to Savannah, Ga., via Ga. R. R., Augusta, Ga., C. & W. C. Ry., Yemassee, S. C., and A. C. L. R. R.

23168. **Lime**, C. L., min. 70,000 lb. Establish 110c net ton, Keystone, Scotrock, Landmark, Longview No. 2 and Greystone, Ala., to Bessemer, Ensley, Fairfield, Tarrant, Thomas and Woodward, Ala. Truck competitive. Expires June 30, 1941.

23172. **Lime**, C. L., min. 70,000 lb. Establish 135c net ton, Graystone, Ala., to Alabama City, Ala. Truck competitive. Expires June 30, 1941.

23538. **Crude feldspar**, C. L., min. 60,000 lb. Establish 35c net ton to Erwin, Tenn., from Clinchfield R. R. stations Altapass, N. C., to Lost Cove, N. C., incl., and 50c net ton from B. M. Ry. stations. Transit arrangements applying at Erwin, Tenn., in C. C. & O. Ry. Feldspar Transit Tariff 5, I. C. C. 167, to be canceled simultaneously with effective date of proposed rates.

23209. **Sand and gravel**, C. L. Establish 35c net ton from Hattiesburg, Miss., to Saucier, Wortham, Lyman and Landon, Miss. Truck competitive. Expires June 30, 1941.

23502. **Limestone**, ground or pulverized, C. L. Establish 156c net ton, Mascot, Tenn., to Franklin, N. C.

Texas-Louisiana

5067. **Sand, gravel, crushed stone.** Establish rates in cents per ton of 2000 lb. shown below to Eastgate, Tex.:

100c from Carley on sand and gravel and asphalt coated sand and gravel; 120c from Victoria on sand and gravel; 145c from Dittlinger and Ogden on crushed stone and 137c on crushed asphalt rock and asphalt coated stone; 188c from Blewett, Dabney, Pulliam and Whites Mine on crushed asphalt rock and asphalt coated stone.

Proposed rates are to apply only on material consigned to this particular project and to expire with completion thereof, but not later than June 30, 1941. Same reduction in cents per ton of 2000 lb. to be made from other producing points on request.

Illinois Sand and Gravel Rate Dispute Settled

THE UNITED STATES SUPREME COURT has considered the controversy regarding adjustment of alleged illegal rates on sand and gravel between September 10, 1925, and February 15, 1927, applicable on shipments from origins on the North Western and the Milwaukee railroads to Chicago in what is known as Zone 1. In No. 139, Chicago & North Western et al vs. Rockwell Lime Co., the court has refused to review the decision of the Supreme Court of Illinois. In the application for review the railroads asserted that the Illinois court directed the Illinois commission to require the railroads to make restitution in disregard of the fact that the contentions of the respondent were found to be without foundation by the Illinois commission and by the federal body.

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National Gypsum Buys Paper Mills

NATIONAL GYPSUM Co., Buffalo, N. Y. ,has purchased the Windsor Paper Mills, Inc., Newburgh, N. Y., at a price of about $200,000. President Melvin Baker of the gypsum company stated that this purchase is the beginning of a program to manufacture all of the major items required in making the company's own products. The paper will be used on gypsum lath manufactured by the five eastern board mills of the company. Along with this expansion, the National Gypsum Company will spend $400,000 in four of the smaller board plants to lengthen the driers and make other improvements to step up production to fill government orders now totaling 6,000,000 ft. of gypsum board.

Cement Production Shows Big Gain

BUREAU OF MINES reports that the portland cement industry in September, 1940, produced 13,123,000 bbl., shipped 14,760,000 bbl. from the mills, and had in stock at the end of the month 19,913,000 bbl. Production and shipments of portland cement in September, 1940, showed increases of 10 to 12.6 percent, respectively, as compared with September, 1939. Stocks at mills were 12.2 percent lower than a year ago.

The total production for the nine months ending September 30, 1940, amounts to 92,531,000 bbl., compared with 88,739,000 bbl. in the same period of 1939, and the total shipments for the nine months ending September 30, 1940, amounts to 96,070,000 bbl. compared with 92,530,000 bbl. in the same period of 1939. All manufacturing plants reported.

In the following statement of relation of production to capacity, the total output of finished cement is compared with the estimated capacity of 162 plants at the close of September, 1939, and 160 plants at the close of September, 1940.

RATIO (PERCENT) OF PRODUCTION TO CAPACITY

	Sept.		Aug.	July	June
	1939	1940	1940	1940	1940
The month...	56.4	62.8	57.9	56.0	58.9
12 months....	46.0	49.4	48.0	47.9	48.2

To Rebuild Lime-Putty Plant Destroyed by Fire

STANDARD BUILDING MATERIAL Co., Birmingham, Ala., has announced that the lime-putty plant and building material warehouse which were destroyed by fire on September 27 will be completely rebuilt. The old plant was of the standard Blue Diamond design.

The new plant will comprise a standard Brooks-Taylor lime-putty slaking unit, and a Blaw-Knox 110-ton batching bin with a compartment for bulk cement storage. Weigh batching equipment will be used to batch the sand and cement, and the lime-putty aged in the Brooks-Taylor patented aging tanks will be pumped to a 1-cu. yd. mortar mixer where it will be mixed in approximately two minutes. The mixer will be furnished by the Multiplex Concrete Machinery Co.

A modern sand unloading and elevating system will be installed, and a concrete tunnel reclaiming conveyor system will be placed under a stockpile reserve sand supply of approximately 350 cu. yd.

Mill Improvement

UNIVERSAL ATLAS CEMENT Co., New York, N. Y., has let a general contract to Rust Engineering Co., Pittsburgh, Penn., for an addition to its Hudson, N. Y., plant which with equipment will cost about $125,000.

•

UNIVERSAL ATLAS CEMENT Co. has moved its Kansas City, Mo., sales offices to the R. A. Long building. W. H. McDowell is sales manager, and L. B. Thomas is assistant sales manager.

AGRICULTURAL LIMESTONE PULVERIZERS

Why do so many Agricultural Limestone plants buy BRADLEY PULVERIZERS?

We have the answer—ask us. Send for descriptive literature.

BRADLEY PULVERIZER CO.

Works and Sales Office, ALLENTOWN, PA.

SIMPLICITY

GYRATING SCREENS have made a remarkable record of real service when compared with competitive equipment under actual operating conditions.

The American Aggregates Corporation has operated many Simplicity Screens in their various plants throughout the past years. Because of the results secured, it was natural for them to install Simplicity Gyrating Screens in their new Columbus plant.

You too, can have capacity, efficiency and low operating costs by installing Simplicity Screens.

Simplicity

ENGINEERING COMPANY

DURAND, MICHIGAN

THE Leahy HEAVY DUTY

No-Blind VIBRATING SCREEN with TRI-VIBE —for Fine Mesh Screening

LARGE CAPACITY—CONTINUOUS UNIFORMITY—PROVEN ECONOMY

90% to 97% Efficiency Rating. Only ½ H. P. Required for Maximum Load.

Write for Bulletin No. 14-H.

THE DEISTER CONCENTRATOR COMPANY

The Original Deister Co., Est. 1906

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No Other Crusher Will Work for You Like This

DIXIE NON-CLOG Hammermills and Regular Stationary Breakers are unexcelled for primary, secondary or fine reduction. Note the simple, sturdy swing hammer construction and the specially designed, continually moving breaker plate which is an exclusive DIXIE feature. This is an exceptionally powerful and dependable unit for handling cement rock, clay, shale, silica, sand, gypsum, coal, etc. Made in 40 different sizes.

Write for further details.

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SLY CAN HELP YOU SOLVE YOUR *DUST* PROBLEM

SLY DUST FILTER INSTALLATIONS ARE

- Simple in design
- Easily installed
- Economical in space and power

They are not expensive in first cost. They pay for themselves in various ways.

Over 40 years' experience.

Ask for new Bulletin No. 98.

THE W. W. SLY MFG. CO.

Branch Offices in Principal Cities

4746 Train Avenue Cleveland, Ohio

★ *Two Sly Dust Filters in use at large Cement Plant.* ★

OBITUARIES

BROCKWELL STATTER, president, manager and sales manager of Beaver Portland Cement Co., Portland, Ore., died September 27 at the age of 62. Born in England, he came to Oregon as a boy 55 years ago.

•

GEORGE E. KIDDER, president of the Cement Products Co., Wilmington, N. C., died September 17 at the age of 53.

•

ISAAC N. BAIR, sales manager of the Thomasville Stone and Lime Co., Thomasville, Penn., died October 15.

•

WILLIAM H. PRICE, president of the Gibsonburg Lime Products Co., Gibsonburg, Ohio, died October 15 at the age of 72. He also was a director of the United Savings & Loan Association, Toledo.

•

EARLE MACDONALD, vice-president in charge of operations of the Riverside Cement Co.'s plants at Crestmore and Oro Grande, Calif., died September 27. He was 64 years of age. Mr. MacDonald was in charge of the electrical system of the Crestmore plant when it was placed in operation in 1910. In 1914, he was named assistant superintendent of the plant and in 1918 was made superintendent, a post which he held until 1918, when he became general superintendent. In 1937, he was appointed vice-president in charge of operations.

•

E. O. FREEMAN, superintendent of the Carl Lotz Sand & Gravel Co., Wausau, Wis., and an employe of the Lotz company for nearly 30 years, died September 25 at the age of 57.

•

CYRUS H. COLE, at one time sales manager of the New York office of Universal Atlas Cement Co., died Oct. 14. He was 64 years of age.

•

LEWIS NIXON, president of the Raritan Sand Co., Nixon, N. J., died September 23 at the age of 79. He also was president of the Nixon Nitration Works and was renowned as an industrialist, politician and a ship designer. A graduate of the U. S. Naval

---

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of August 24, 1912 and March 3, 1933

Of ROCK PRODUCTS, published monthly at Chicago, Illinois, for October 1, 1940.

State of Illinois, County of Cook, ss.

Before me, a notary public in and for the State and county aforesaid, personally appeared Geo. C. Williams, who, having been duly sworn according to law, deposes and says that he is the Business Manager of Rock Products and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are:

Publisher—Tradepress Publishing Corporation, 309 W. Jackson Blvd., Chicago, Ill.

Editor—Nathan C. Rockwood, 309 W. Jackson Blvd., Chicago, Ill.

Managing Editor—Ralph S. Torgerson, 309 W. Jackson Blvd., Chicago, Ill.

Business Manager—George C. Williams, 309 W. Jackson Blvd., Chicago, Ill.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

Tradepress Publishing Corporation, 309 W. Jackson Blvd., Chicago, Ill.; J. L. Frazier, 2043 Orrington Ave., Evanston, Ill.; Geo. C. Williams, 2000 Lincoln Park West, Chicago, Ill.; J. B. Maclean, 7 Austin Terrace, Toronto, Ont., Canada; Horace T. Hunter, 120 Inglewood Drive, Toronto, Ont., Canada; H. V. Tyrrell, Willowdale Post office, Ont., Canada; Christine Hunter, 120 Inglewood Drive, Toronto, Ont., Canada; H. W. Hunter, 4806 Lacombe, Montreal, Que., Canada; D. F. Hunter, 23 Whitehall Road, Toronto, Canada; Stewart Bagnani, Port Hope, Ont., Canada.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is: (This information is required from daily publications only.)

GEO. C. WILLIAMS,
Business Manager.

Sworn to and subscribed before me this 30th day of September, 1940.

(Seal) CLARA S. LYNCH.

(My commission expires Feb. 6, 1944.)

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Why You Should Specify
COLMONOY
NICKEL BASE HARD FACING ALLOYS

1. Gives longer life
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Hard Surfacing Alloys and Overlay Metals

UNIFORM SEPARATION *for* LIME AND CEMENT

GAYCO Air Separators will make it easier to maintain a pre-determined circulating load and step up your mill capacities and efficiency. All fines are removed as they are made, thereby preventing the cushioning effect of the fine material. Coarse particles are rejected by a new type adjustable centrifugal sizing fan — an exclusive GAYCO feature.

With a GAYCO you get all these advantages:

99% through 325 mesh
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Uniform products
Not affected by variation of speed or rate of feed

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for ROCK— SAND—GRAVEL

Single and double roll and jaw crushers, hammer mills, super dry pans, steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists. Complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.

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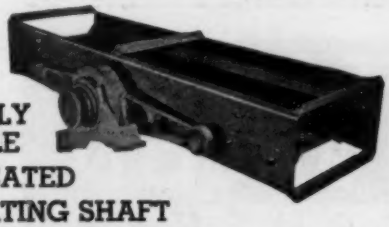
Established 1835
Hollidaysburg, Pennsylvania



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Hayward makes all four—clam shell, drag-line, electric motor, orange peel. A Hayward recommendation is unprejudiced.

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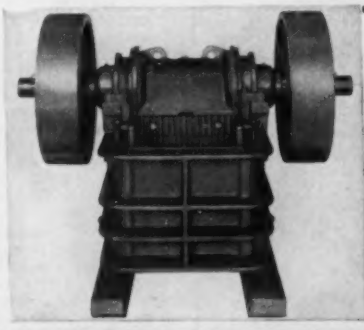

Quick and Easy Adjustment for Various Sizes . . . . The DAY JAW TYPE CRUSHERS

Ask for details of this famous Crusher that has proved "You can't go wrong in a DAY."

Brooks EQUIPMENT & MFG. CO.
KNOXVILLE TENNESSEE

SECO
VIBRATING SCREENS

Patented

FAST BECOMING RECOGNIZED AS THE BEST.

THE PATENTED CONTROL OF THE VIBRATING MOTION IS THE REASON.

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INC.
9 Lafayette Ave. Buffalo, N. Y.

FARREL
BACON
CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

Engineering Service

EARLE C. BACON, Inc.
17 John St., New York, N. Y.

Academy, he designed the battleships Oregon, Indiana and Massachusetts while connected with the naval construction corps. Later he designed and built vessels on his own account.

•

COL. FRANCIS CLARK HARRINGTON, WPA Administrator, who also assisted Gen. William Goethals in the construction of the Panama Canal, died September 30. He was 53 years of age.

•

FREDERICK W. GRICE, sales engineer for Broderick & Bascom Rope Co., St. Louis, Mo., died recently at the age of 54. He joined the company in 1908 shortly after graduating from the engineering school of Washington University and was appointed sales-engineer serving the mining industries in 1931.

•

EDWARD J. HARDING, managing director of the Associated General Contractors of America, died October 5. When the A.G.C. was formed in 1919 he became field secretary. Then he advanced to its membership manager in 1926, assistant general manager in 1929 and managing director in 1930.

New Incorporations

Mica Corporation of America, 816 Odd Fellow Bldg., Indianapolis, Ind., capitalized at 10,000 shares of $100 par value, has been granted a charter. Incorporators are Fred V. Lee, French E. Poe and Rex E. Poe.

Acme Silica Sand Co., Ottawa, Ill., has been incorporated by J. L. Neary, P. J. McManus, and J. E. Malone, Jr., and is valued at 2500 shares common stock, $10 par value. Correspondent is J. E. Malone, Jr., State Bank Bldg., LaSalle.

Harris Concrete Co., Inc., Corpus Christi, Tex., has been granted a charter. Capital stock is $6000 and incorporators are H. C. Heidenfels, W. C. Hall and E. W. Harris.

Etoway Sand and Gravel Co., Rome, Ga., has been incorporated by J. Lindsey Johnson, E. R. Austin and Marvin Austin, to dredge and process sand and gravel. The right to buy and sell lime, cement and other building materials has also been granted.

Wickford Sand & Gravel Co., Inc., Providence, R. I., has been granted a charter. Capitalized at 100 shares no par value stock, its incorporators are Christopher Del Sesto, Alice C. Norberg and Grace A. Barry.

Highland Ground Limestone Co., Inc., Monterey, Va., has been granted a charter providing for a maximum capital of $10,000. Stewart Bolling of Cleveland, Ohio, is president and R. R. Turner Jones of Monterey is attorney.

Marcus S. Wright, Inc., South River, N. J., has been incorporated. Authorized stock is 500 shares of preferred stock with par value of $100 each and 1500 shares of common stock with no par value. Incorporators are Marcus S. Wright, Jr., William S. Wright, Mable Knote, George Wright, Edna B. Wright, and Milton R. Wright.

Cement Products Co., Inc., Lubbock, Tex., with a capital stock of $1000 has been incorporated by Leslie Neill, James Caserta and Leo Chesley.

Hodgson Limerock Corp., Orlando, Fla., has been granted a charter. Capitalization is 750 shares, $100 par value each, and directors are L. B. McLeod, W. M. Smith, Jr., and A. H. McLeod.

BlockHouse, Inc., 1007 West 45th Ave., Gary, Ind., has been incorporated with a capital of 250 shares of $100 par value each by Barney Golkowski, Carlin Felter and Wallace E. Kosiba.

Mount Tolmie Sand and Gravel Co., Ltd., Victoria, B. C., has been incorporated for $125,000.

Hartford Concrete Units Co., Hartford, Conn., has been incorporated by Walter J. Kelly, John P. Kelly and Joseph D. Russo.

Armena Lime Corp., Albany, Ga., has been granted a charter, capitalized at 500 shares of no par value and 250 shares with a par value of $100. The charter provides that the amount of capital the company is to begin business with will be $25,000. Incorporators are Dermot Shemwell, Sr., Dermot Shemwell, Jr., and E. R. Culbertson.

Manufacturers' News Notes

Chain Belt Co., Milwaukee, reports that Morrison Mills, eastern district manager of the construction equipment division, died on September 25.

Allen-Sherman-Hoff Co., have opened an office in New York City at 271 Madison Ave., with B. C. Berry and P. D. Oesterle in charge.

Falk Corp., Milwaukee, Wis., announces the election of M. A. Carpenter as executive vice-president and as a director. Associated with the Falk company for 16 years, he will continue to be active as director of sales and advertising in addition to his new duties.

Taylor-Wharton Iron & Steel Co., High Bridge, N. J., has appointed L. E. MacFadyen, associated with the company since 1922, as superintendent of its plant.

Wellman Engineering Co., Cleveland, announces the election of Dr. James Campbell Hodge, well known metallurgist, as vice-president and director of the company.

Hercules Powder Co., Wilmington, Del., announces the resignation of G. Rheuby, vice-president and director, from the executive committee. A. B. Nixon, director and formerly general manager of the company's naval stores department, was elected a vice-president and member of the executive committee, filling the position vacated by Judge Rheuby. A. E. Forster succeeds Mr. Nixon.

Athey Truss Wheel Co., Chicago, Ill., reports the passing of its president, James A. Roberts. He had been president of the company for four years and had been connected with it for twenty.

Timken Roller Bearing Co., Canton, Ohio, reports the death of Henry H. Timken at the age of 70. Mr. Timken was founder of the company and at the time of his passing was chairman of the board.

National Industrial Advertisers Association elected the following officers at its recent annual conference, held in Detroit: President, Richard P. Dodds, advertising and sales promotion manager of the Truscon Steel Co., Youngstown, Ohio; vice-presidents: E. J. Goes, Koehring Co., Milwaukee; Herbert V. Mercready, Magnus Chemical Co., Garwood, N. J.; Terry Mitchell, Frick Co., Waynesboro, Penn.; W. D. Murphy, Sloan Valve Co., Chicago; Louis J. Ott, Ohio Brass Co., Mansfield, Ohio; and R. T. Reinhardt, California Corrugated Culvert Co., Berkeley. E. C. Howell, of the Carboloy Co., Detroit, was elected secretary-treasurer.

"PENNSYLVANIA" REVERSIBLE HAMMERMILL

preparing 42" Gyratory's output of hard Limestone to size required for the efficient performance of modern Grinding Equipment.

Major crushing by smashing impact,—Automatic Hammer Turning and Resharpening,—Lower Power Demand,—and Sharply cut upkeep cost.

Send for Bulletin No. 1030.

PENNSYLVANIA CRUSHER COMPANY

Liberty Trust Bldg.
PHILADELPHIA, PA.

PUT YOUR REDUCTION PROBLEMS UP TO US

RYERSON CERTIFIED STEELS

LARGE STOCKS...IMMEDIATE SHIPMENT

Principal products include—Alloy Steels, Tool Steels, Stainless Steel, Hot Rolled Bars, Hoops and Bands, Beams and Heavy Structurals, Channels, Angles, Tees and Zees, Plates, Sheets, Cold Finished Shafting and Screw Stock, Strip Steel, Flat Wire, Boiler Tubes, Mechanical Tubing, Rivets, Bolts, etc. Write for Stock List. Joseph T. Ryerson & Son, Inc. Plants at Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

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ROTARY FEEDERS - DISCHARGE GATES

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PERFORATED METAL SAND AND GRAVEL SCREENS

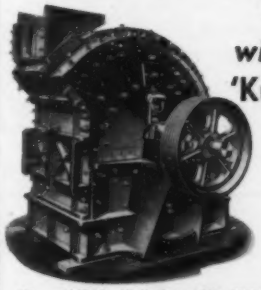
Manufactured exactly to your specifications
Any size or style screen, in thickness of steel wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices

CHICAGO PERFORATING CO.
2437 West 24th Place
CHICAGO, ILLINOIS
Canal 1459

PRODUCE BETTER AGGREGATE AT LOWER COST

with the Cedarapids 'Kubit' Impact Breaker



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- MAKES SMALLER SIZES WITH LESS WASTE.
- PRODUCES A BETTER GRADATION OF AGGREGATES

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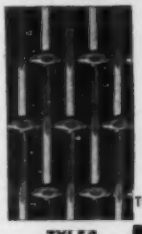

SCREENS UP TO 10" STONE!

THE TY-ROCK SCREEN

TYLER WIRE CLOTH IN ALL MESHES AND METALS

HIGH CAPACITY SCREEN FOR ROCK AND ORE

The W. S. TYLER Company

3615 Superior Ave. • Cleveland, O. • U. S. A.

SUPER-LOY WOVEN WIRE SCREENS

LUDLOW-SAYLOR WIRE CO. ST. LOUIS

WILFLEY centrifugal SAND PUMPS

for Slurries, Sand Tailings, Slimes, Acid Sludges

Save Pumping Costs

Continuous operation without attention for long periods. Stuffing box, stuffing, gland water ALL eliminated. Close clearances maintained by easy slippage seal adjustment. Heavy pumping parts of material best suited for YOUR particular problem. Complete engineering service. Prompt shipment of parts. The most efficient and economical pump you can buy. *Write for Complete Catalog*

A. R. WILFLEY & SONS, Inc., Denver, Colo., U. S. A.

NEW YORK OFFICE: 1775 BROADWAY

Classified Advertisements

IMMEDIATE DELIVERY IS IMPORTANT TODAY!

BELT CONVEYORS

1—120′ c/c, 36″ Stephens-Adamson, anti-friction idlers.
1—120″ c/c 18″ Barber-Greene, steel framework.
2—Barber-Greene 24″, on steel framework, one 126′ long, the other 150′ long.

AIR COMPRESSORS

4—700 CFM Actual Delivery Worthington Type V-6, 100 lb. pressure, each Twin Unit with 200 H.P. 3/60/440 volt motor direct connected. Now in service and will be released in two weeks.
2—700 CFM Ingersoll-Rand No. 90-CH 2-stage, air cooled, including motor, 1939.
2—Sullivan Type WN-102, two stage, 550′, new 1939.
2—Ingersoll-Rand 830 cu. ft. air cooled, electric driven, 100 lbs., 1939.
1—Chicago Pneumatic OCE 20x12x14; synchronous motor.

SHOVELS AND CRANES

3—50B Steam Shovels, 1¾ yd., Shop No's. 4330, 4688, 5042.
1—Marion No. 450 all-electric, 1¼ yd. Caterpillar Shovel.
1—2 yd. Lima, Model 850, with Caterpillar Diesel D-17000 Engine, 1937.
1—2 yd. Marion, Model 381 Comb. Shovel and Crane, Buda Diesel, 1937.
1—Northwest 2½ yd. Diesel driven Shovel, full revolving, 1937.
1—Bucyrus-Erie 2 yd. 50-B steam driven Dragline Crane and Shovel, aluminum dragline boom and little used shovel front.
1—Truck Crane "Universal" 7½ ton.

CENTRIFUGAL AIR SEPARATORS

10′ Sturtevant; 8′, 10′, 12′ Gayco; 6′ Raymond; also 5′ dia. Raymond "Whizzer" for attachment to roller mill.

LOCOMOTIVE CRANES

1—20 ton Link-Belt 8-wheel std. ga. double drum; 50 ft. boom, Massachusetts boiler; cast steel side frames on trucks.
1—35 ton Link-Belt, 8-wheel, std. ga.
1—50 ton Industrial Type K, 8-wheel.

RAYMOND PULVERIZERS

2 roll and 3 roll High Side—4 and 5 roll Low Side; No.'s 0000, 00, 1 and 3. Beater type—Also No.'s. 55, 60, 90 Imp type, also No. 40 Imp with 6′ Centrifugal Separator.

CEMENT MILL MACHINERY

We purchased the entire plant of the Castalia Portland Cement Co., Castalia, Ohio, 60 miles from Cleveland. The liquidation is almost finished, but the following are some of the items still available for immediate shipment:

3—Rotary Kilns—8x125′, 6x129′, 6x60′.
3—Direct Heat Rotary Dryers—4′6 x 50′, double shell; 4x60′, 6x60′.
2—5x10′ Bonnot Ball Mills, steel lining, wtih motors.
2—5x22′ Tube Mills, silex, with motors.
1—8′x30″ Hardinge Conical Ball Mill, iron lined, with motor.
2—5x27′ Tube Mills, silex, with motors.
3—18 ton Steam Locomotives, Vulcan and Porter, 36″ ga.
100—1½ yd. two-way Steel Dump Cars, 36″ ga.
1800 Horsepower in Electrical Motors, all 3/60/440 volt; included are 150 H.P. and 200 H.P. Slip Ring Motors, 585 RPM.

HARDINGE CONICAL BALL MILLS

3′x8″, 5′x22″, 6′x22″, 7′x22″, 8′x30″, 8′x72″.

ROTARY KILNS

9′x160′, 8′x150′, 8′x125′, 8′x100′, 6′x120′, 6′x60′.

ROTARY DRYERS—Direct Heat

Ruggles-Coles, double shell; 5′x26′, 5′x30′, 5′6x60′, 80″x45′, 104″x60′, 104″x85′. Single Shell; 4′x30′, 5′x30′, 6′x40′, 6′x56′, 6′x60′, 8′x60′, 8′8″x85′.

BALL, ROD AND TUBE MILLS

Ball Mills: 3′x5′, 5′x10′, 6′x6′, 6′x8′.
Rod Mills: 4′x8′, 6′x12′ Hardinge, straight side; 5′x10′, 5′x12′ Allis-Chalmers.
Tube Mills; 3′x12′, 4′x16′, 5′x20′, 5′x35′.

VIBRATING SCREENS

Allis-Chalmers 5′x10′, 3 deck; Stephen-Adamson 4′x8′, 2 deck; Tyler Hummer 3′x5′, 4′x5′ 1 and 2 decks; 4—4′x7′ Leahy, two deck; 4′x8′ Huron, 1 deck; 3—4′x7′ Jeffrey-Traylor, 2 deck; Symons 4′x10′ 4′x12′ 5′x10′ 2 deck. Also Rotex, Robinson and other makes.

SYMONS CONE CRUSHER

1—7 ft., with fine bowl.

GYRATORY FINISHING CRUSHERS

1′8″ and 2′4″ Traylor TY; 410-TZ, 4′ Traylor; No. 19, 25, 37 and 49 Kennedy.

GYRATORY CRUSHERS

36″ Allis-Chalmers Style "N," short shaft; 30″ Allis-Chalmers Superior McCully; 42″ Gates; 20″ Kennedy Gearless; 20″ Traylor; 20″ Allis-Chalmers Superior McCully; 15″ Telsmith; 13″ Superior McCully and smaller sizes.

JAW CRUSHERS

48x42 Traylor Bull-dog; 66x86 Traylor; 48x60 Traylor; 36x24 Farrel; 18x36 Farrell; 24x36 Allis-Chalmers; 8x36 Universal Roll Jaw; 18x30 Allis-Chalmers and smaller sizes.

CONSOLIDATED PRODUCTS CO., Inc. **15-16-17 Park Row, New York, N. Y.**

Our Shops at Newark, N. J., cover eight acres

CRUSHERS

GYRATORY: 42″ McCully with 80% brand new parts. 36″ Allis-C. 20″ Super. McCully conv. to 16″. Gates Nos. 10, 9, 8, 7½, 6, 5, 4, 3, 2, 1 (75 avail.) Telsmith Nos. 4, 5, 6, 8C, 9 & 16. Also Many Austins, Kennedys and Traylors, many sizes.
JAW TYPE: Traylor 60x84, 48x60, 42x48, 24x72. Superior 84x66 & 24x36. Buchanan 30x42. Farrel 60x42, 30x36, 24x36, 18x36, 12x24. Good Roads 1030. Acme 24x40. Misc. 7x12, 9x16, 8x20, 8x24, 12x24, 9x36, 9x30, 15x36.
REDUC. TYPE: Kennedy Nos. 25, 37 & 49. Telsmith 3-F & 40. Traylor 36″ TZ, 8″, 10″, 12″ Super. McCully 6″ & 10″. Newhouse 5, 7 & 10″. Symons Cone & Disc Ty. 2′ to 4′.
ROLLS: Allis-C. 12¼x12, 36x16, 40x15, 54x24 & 72x30. Fairmount 36x60 & Jeffrey 24x24 to 36x54 single roll. Cornish 36x14 & 42x16, Etc., Etc.
HAMMERMILLS: Williams No. 1, 2, 3, 4, 5 & 9. Jeffrey 36x18 & 36x42. Day Nos. 20 & 40, Etc.
MILLS: Kennedy Ball 4x6, 5x6 & 5x8. Marcy 8x6 & 10x9. Hardinge 6′x3′, 8′x30′ & 6′x9′. Misc. Tube Mills 5′ & 6′ x 22′. Sturtevant Ring Roll, Raymonds, Kents, Fuller-Lehigh, Etc., Etc.
CRUSHING PLANTS: No. 65 Diamond. No. 22 Pioneer 8x24. 1030 Good Roads, 9x40 Austin-Western, 9x36 C.R.

MISCELLANEOUS ITEMS

Barges, Bins, Buckets, Boilers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryer, Derricks, Draglines, Drag Scrapers, Dredges, Drills, Engines, Elevators, Excavators, Generators, Hoists, Kilns, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Slacklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices. **(I have equipment at many points in the United States and Canada. What you need may be near your plant.)**

ALEXANDER T. McLEOD
7229 Rogers Avenue **CHICAGO**

FOR PROMPT SHIPMENT SUBJECT TO PRIOR SALE

Good Used Crushers and Pulverizers

15x24 Blake Type Jaw Crusher.
24x20 GRUENDLER Hammer Mill (6 ton hr.)
Model K Day Lime Pulverizer (3 ton per hour.)
Jeffery No. 12 Combination Lime Pulverizer (3 to 4 tons per hour).
No. 7 Mitts & Merrill Wood Hog.
Gruendler—15 ton per hour Lime-Pulverizer.
Gruendler—10 ton per hour Lime-Pulverizer.
Reconditioned Crushing Plant includes 15x36 Jaw and 30x18 Roll Crusher, Elevator, Screen, Bin, Power Units. (Will sell in separate units.)

CRUSHER SERVICE, Box 795, St. Louis, Mo.

- 24″ x 36″ Farrell Jaw Crusher.
- 18″ x 36″ Farrell Jaw Crusher.
- 18″ x 36″ Buchanan Jaw Crusher.
- 20″ Traylor Gyratory Crusher.
- 2′4″ Traylor Gyratory Crusher.
- 10-29 Good Roads Roller Bearing Jaw Crusher.
- 2′ Telsmith Cone Crusher.
- Jeffery Hammer Mill.
- 495′ of New 36″ 7 Ply Conveyor Belt.

BLUE BALL MACHINE WORKS
BLUE BALL **PENNA.**

FOR SALE

Two—Style B, 16″ Newhouse crushers, Manganese fitted throughout, with spare eccentrics. Complete with 100 H.P., 440 volt, 60 cycle motors and steel fabricated supporting structures.
One—Fuller-Lehigh 24″ X 24″ Crushing Roll with new manganese smooth rolls.

GENESEE STONE PRODUCTS CORP.
Batavia, N. Y.

DEPENDABLE BARGAINS

We have for sale complete quarry equipment (of a large public utility) which is being discontinued. This includes—

One—20-ton Howe track scale.
One—50-B three-motor Bucyrus crawler shovel.
One—Link-Belt 8-wheel locomotive crane, 46′ boom, 2 cu. yd. grab bucket electrically operated.
One—10-ton Clyde steel derrick, 70′ boom.
One—Double-drum Clyde electric hoist, with boom swinging attachment.
One—No. 44 Clipper blast well drilling machine.
One—No. 14 Junior electric drilling machine.

Also pumps, compressors, stone skips, crushed stone washing and screening plant complete, 3 Superior McCulley crushers, elevators, etc. Everything priced low to move for cash. Equipment all in excellent mechanical condition.

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325 S. 16TH ST. **MILWAUKEE, WIS.**

New—RAILS—Relaying

ALL SECTIONS

Also contractors' equipment, "V" shaped and Western cars, 24 and 36-in. gauge, portable track, gas locos, frogs and switches. Attractive prices quoted. Wire, write or telephone for quotations.

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25 St. Nicholas Building **Pittsburgh, Pennsylvania**

¼, 1, 1¼ yd. Owen & Williams Buckets
30, 35 HP Gas Hoists
50, 60, 100 HP Elec. Hoists
1¼ Nwest Shovel Attachment
1¼ B-Erie 41B Shovel attachment
1 yd. Page Dragline Bucket
½, ¼, 1¼ Gas Crawler Cranes

J. T. WALSH
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30-TON S/G LIMA GASOLINE, 0-4-0 SWG. LOCO. NEW 1931, GOOD COND. ROLLER BEARING. Immed. Delivery. SEND US YOUR INQUIRIES FOR ANY KIND OF LOCOMOTIVES.

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***"Anything* containing IRON or STEEL"**

No. 19, 20 & 25S Kennedy, 9 & 12A, 9 & 10B, 32 & 36 Telsmith, No. 4, 6 & 36″ TZ Traylor Gyratory Crushers.
10x18″ Webb City, 15x36 & 24x36″ Farrell, 24x36″ Carroll, 24x72″, 36x48″ & 60x84″ Traylor Jaw Crushers.
30x14″, 30x30″, 36x16″, 40x15″ Crushing Rolls.
22x30 & 24x36″ McLanahan single roll Crushers.
Three—8 yd. Euclid Trax-Trux pneumatic tires.
1½ yd. Page type C Dragline Bucket—bargain.
110 HP Anderson type K Diesel Engine. Others.
Let us have your inquiries. Ask for Bulletin No. 51.

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710 Eastgate St. Louis, Mo. **Pa. 2290**

Wms. No. 4 Jumbo Jr. hammermill. Also Wms. No. 4 Jumbo.
Brownhoist 15-20 ton 8 wheel Loco.Crane. Real buy.
Port. Crushing & Screen. plants, inc. 9x36 & rolls.
Barber-Greene 42 loader, barg. Also Model 82.
Conveyors—24″x40′—50′—60′—80′, inc. portables.
Screens—3 deck 4x10;2 deck 3x8 & 4x8;1 deck 4x6.
Bins—60-100 ton; 35 yd. & scales; Weigh batchers.
1¼ yd. Gas shovel-crane-drag.; 1¼ yd.Diesel shov.
NW ½ & 1 yd.shovels-cranes-drags. ;NW 1 yd.drag.
Shovel boom & or sticks-dipper-etc.,for P&H ¾ yd.

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AIR COMPRESSORS
Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

BINS
9—2 compartment bins; 2—118 ton Blaw Knox; 1—75 ton Butler V-40; 2—72 ton Blaw Knox; 1—60 ton Butler V-40; 1—35 ton Blaw Knox portable; 1—26 ton Heltzel portable with Kron dial scale. All above with or without volume or weigh batchers.

BUCKETS
26—Clamshell, all sizes and types; Williams, Blaw Knox, and Owen.
6—Dragline: 1—1¾ yd. Northwest; 1—1½-yd. Omaha; 1—1¼ yd. Page; 2—1 yd. Hayward; 1—¾ yd. Page.
1—1½ yd. Pioneer Cableway Excavator bucket.
7—Dragscraper: 2—1 yd. Sauerman; 1—1 yd. Green; 1—¾ yd. Garst; 2—½ yd. Garst.

CRANES, DRAGLINES and SHOVELS
1—Link-Belt, K-55, Serial No. 1698, 70′ boom, 2 yd. bucket, also have 2 yd. shovel attachment.
1—Link-Belt, K-45, Speedomatic, Caterpillar Diesel 13000 with 50′ boom and 2 yd. dragline bucket.
1—Bucyrus Erie 1½ yd., 33-B, A.C. electric tunnel shovel.
1—Northwest Model 104, Serial No. 2079, 45′ boom, 1½ yd. bucket; with 1 yd. shovel attachment.

SPECIAL
1—Blaw-Knox 120 ton lev. cap. 4 compartment steel bin with extra 100 barrel cement compartment dial scale for weighing 1½ yd. batch and separate dial scale for weighing bulk cement, complete with Fairbanks-Morse water weighing device.

1—Industrial Brownhoist Model D.C., 15-ton cap. with 40′ boom.
1—Link-Belt Model K-42, Serial No. 1265, 45′ boom, 1¼ yd. bucket, also 1 yd. trench hoe attachment or 1¼ yd. shovel front.
3—Northwest Model 105, Ser. Nos. 2556, 2653, 1645, 40′ boom, 1 yd. bucket with one shovel attachment.
1—Bucyrus Erie Model 1055, Ser. No. 11034, 50′ boom with 1 yd. bucket.
2—Osgood Heavy Duty, Serial No. 2069 and 2087, 40′ boom, 1 yd. bucket and with 1 yd. shovel attachment.
2—Thew ¾ yd. Gasoline Shovel with ¾ yd. shovel front and 40′ crane boom. Serial No. 2687 and No. 2801.
1—P&H, ¾ yd. Gasoline Crane with 40′ boom. Serial No. 1834.
1—Koehring Model 301, Serial No. 544, 40′ boom ¾ yd. bucket.
1—Lorain ¾ yd. shovel, Model 79, close couple ball with reversible dipper teeth, powered by 75 HP 440-60-3 motor.
1—Bucyrus Erie ¾ yd., Model 1020, combination.
1—Northwest No. 2 crane, new 1937 with 40′ boom.
1—Byers Bearcat Model 27, Serial No. 5289, 30′ boom, ½ cl. sw., ½ yd. bucket.
1—Erie Steam Crane Shovel with 40′ crane boom, with or without ¾ yd. shovel front.
1—Universal Model 35, 50′ boom, ⅜ yd. bucket.
1—Norberg Butler caterpillar mounted tunnel shovel, air driven. Model 110, shop 2168.
1—Conway Mucker type 60, 60 HP, 440-60-3 electric motor with belt boom and bucket.

CRUSHERS
5—Gyratory crushers: 1—No. 5 Allis-Chalmers; 1—No. 5 Austin; 1—No. 5 Gates; 1—No. 3 McCully; 1—No. 0 McCully.
10—Jaw Crushers: 3—15x36" Universal; 1—15x36" Cedar Rapids; 1—15x26" Champion; 1—12x20" Acme; 2—10x20" Climax No. 5½; 1—9x16" Telsmith No. 9A; 1—9x15" Champion.
1—Set of Allis-Chalmers, smooth type crushing rolls, 42x16".

DREDGE PUMPS
1—12" Morris Heavy Duty D. C. to 100 H.P. dbl. cyl. steam engine.
3—Belt Driven: 3—Morris Mang., 1—10", 1—8", 1—6".

HOISTS
1—2 Yd. Thomas 2 speed Class L Cableway excavator hoist with 150 HP electric motor.
1—National 50 HP dragscraper hoist for handling 1 yd. bucket with 50 HP electric or gas power.
1—1 Yd. Cedar Rapids 2 speed dragscraper hoist with 50 HP electric or gas power.
1—1 Yd. Kern variable speed dragscraper hoist powered by 50 HP electric motor.

PNEUMATIC TOOLS
4—Ingersoll-Rand & Gardner Denver Wagon Drills with 1-Rx72 or Gardner Denver Mod. 21 Drills and air hoists.
53—Jackhammer drills: I.R. DCR-23 & S-49 and Gardner Denver, Mod. 57 & 11-D.
17—Drifters, column mounted: 7, Sullivan TJ-10; 4—Gardner Denver Mod. 17; 6—I.R. 73.
3—Drill sharpeners: 2—Sullivan late Mod. Class C and Class A; 1—I.R. 50.

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Used Equipment for Sale

12′x12′x20′ high oversize hopper, sloping grizzly
20′ and 32′ bucket elevators
30″x10′x0″ shaker screen
Model No. U-40 Allis Chalmers engine
60″x20′ Revolving screen—structural frame, portable
10″x20″—10″x36″ and 15″x36″ DIAMOND Roller Bearing Jaw Crushers

New Equipment

9″x16″ DIAMOND crusher—truck mounted with engine
No. 20 Diamond portable crushing and screening plant
2—20-cu. yard 2-compartment jack log bins
2—10″x20″ portable crushing and elevating plants
Special prices for quick sales

DIAMOND IRON WORKS, INC., AND MAHR MANUFACTURING COMPANY DIV.
MINNEAPOLIS, MINNESOTA

Your Inquiries Solicited

20 ton American Locomotive Crane. 50′ boom.
P & H No. 600 1 yd. Gas Crawler Crane. 50′ boom.
36x48″ Traylor Bulldog Jaw Crusher.
16″ Newhouse Gyratory Crusher, 100 HP motor.
20″ & 30″ Traylor TY Reduction Crushers.
240 & 360 HP Fairbks Morse Diesel Generators.
50 Kw Caterpillar 80 HP 220v Diesel Set.

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515 Locust St. St. Louis, Mo.

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Motors and Generators, A.C. and D.C., for sale at attractive prices. New and Rebuilt. All fully guaranteed. Write for List and Prices.

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NEW AND USED PIPE FOR EVERY PURPOSE

Large stocks carried everywhere for spot shipment

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Unusual Items... Unusually Priced

1—6½-yd. Bucyrus 220-B Electric Shovel
168—20-yd. Magor, Western and Koppel Air Dump Cars
50—30-yd. Clark Air Dump Cars, D/T Doors
1—20-yd. 30-ton Electric Dump Car; 550 v. D.C.
12—50-ton Covered Hopper Cars
100—50-ton Standard Hopper Cars
100—50-ton Gondola Cars
100—Tank Cars; or Shells
All other types of both R.R. and Industrial Cars.
Car Repair Parts. Full Line. Approx. 50% saving vs. New.
1—30-ton Lima Gasoline Locomotive.
Locomotives; all types and kinds.

IRON & STEEL PRODUCTS, INC.
13402 S. Brainard Ave. Chicago, Ill.

GOOD REBUILT GUARANTEED CRUSHING AND PULVERIZING EQUIPMENT FOR SALE

at exceptionally attractive prices.——Raymond Two-Roll High Side Mill with 7′ tubular collector. Raymond Three-Roll High Side Mill with 7′ tubular collector and connecting ducts, both these units can be seen set up. Williams "Regular" 12″ x 12″ Hammer-Mill. Martin 6″ x 12″ Jaw Crusher. Hummer 48″ x 60″ Double Deck Screen. Also, Hardinge Ball Mills, Dryers, Conveyors, Gyratory Crushers, Kilns.—Send for new issue of "First Facts" and also for details on any unit in which you are interested. Send us your list of surplus equipment. FIRST MACHINERY CORP., 821 Est 9th Street, New York, N. Y.

8′ x 80′ Revolving kiln
11″ x 16″ Reliance jaw crusher
No. 4 Williams Jumbo hammermill pulverizer
30″ x 22″ American hammermill
75′ centers bucket elevators, 18″ buckets
125, 250, 500 and 750′ belted air compressors
500 K W Diesel engine generator set
2-Speed double drum 100 HP electric hoist
Log washer and sand drag classifier

WM. C. JOHNSON & SONS MACHINERY CO.
1211 Hadley St., St. Louis, Mo.

LIQUIDATION

1—Simonds Disc Crusher, type "B", Shop No. 154
2—No. 66 Smidth Kominuters without balls
1—42″ Fuller-Lehigh Mill, Shop No. 2123
1—6′ x 60′ Cooler or Dryer, Channel Flights
1—4′ x 8′ Traylor Large Size Sheridan Shaking Grizzley
2—Jet Steam Condensers "Deane" 12″ x 22″ x 24″
2—Dean Steam Pumps 7½″ x 8½″ x 6″
1—Type "B" Jeffrey Hammer Mill, 24″ x 36″
2—Type "A" Jeffrey Hammer Mills, 24″ x 18″
Several Hundred Pulleys of various sizes, Shafting, Valves, Fittings, etc.

At Other Locations—

KILNS: 6′ x 36′, 2—8′ x 125′
DRYERS: 3′6″ x 24′, 5′ x 40′, 5′ x 50′
BALL MILLS: 5′ x 8′, 6′ x 8′, 5′ x 22′
HARDINGE MILLS: 4½′ x 16″, 6′ x 22″, 5′ x 22″, 8′ x 30″
RAYMOND MILLS: No. 0000, 00, 1, 3—Roller Mills, 3 and 5 rolls
HAMMER MILLS: Williams, Gruendler, Jeffrey, etc.
MISCELLANEOUS: 4—100 HP Boilers, located Maxwell, New Mexico. Send for Bulletin.

BRILL Equipment Corporation 183 Varick Street, NYC

PRICED FOR QUICK SALE

3—260 HP Buckeye DIESEL Engines dir. con. 175 kw. G.E. 2200/440/220/3/60 200 rpm. AC Generators complete.
1—10 ton Milwaukee Gasoline Locomotive.
1—6 ton Atlas Locomotive 220/3/60 36″ ga.
1—80 kva Fair. Morse 2300/4000/3/60 dir. con. Van Blerck Gas or Gasoline Engines. AC and DC Motors 1 to 1000 HP.

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PITTSBURGH, PA.

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GUARD RAILS, PORTABLE AND INDUSTRIAL TRACK OF EVERY DESCRIPTION. NEW & USED 12 LB. TO 70 LB. RAILS

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3 Kritser & Schultiess Hydrators.

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BELTED: 255, 528, 674, 1060, 1300 & 1570 Ft.
ELECTRIC: 478, 676, 807, 1202, 1722 & 2300 Ft.
DIESEL: 602, 807 & 1060 Ft.
PORTABLE GAS: 110,160,220,310,540 & 1200 Ft.
STEAM: 49, 210, 528, 1200, 2200 & 3600 Ft.

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Owen R A & H Stone Grapples.
2 Yd. OWEN Type S Material Handling.
1½ Yd., 1 Yd. & ¾ Yd. HAYWARD Class E.
48 Steel Skips 6½ x 6 x 2½.
5 Ton Bucyrus Rock Grabs.

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¾ Yd. 5 Ton O & S 30 Ft. Boom.
12 Ton NORTHWEST 50 Ft. Boom Gas.
20 Ton LIMA, 750 Diesel, 65 Ft. Boom.
25 Ton BROWNING & 30 Ton AMERICAN Loco.
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.

CATERPILLAR SHOVELS
¾ Yd. Lima Diesel.
2 Yd. Marion Steam Shovel.
⅝ Yd., 1⅛ Yd.,2 Yd. & 4 Yd. MARION Electrics
1 Yd. NORTHWEST Gas.
1½ Yd. LIMA Diesel.
1½ Yd. BUCYRUS 41B Steamer.
4 Yd. Bucyrus 120B Electric. Also 3 yd. Erie Elec.

DUMP CARS
46—KOPPEL 1½ Yd. 24 & 30 In. Ga.,V Shaped.
15—2 Yd., 3 Yd., 4 Yd., 6 Yd.,12 Yd., 36 In. Ga.
20—Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd.Cap
15—Std. Ga. 50 Ton Battleship Gondolas.

FLAT CARS
9—50 ton std. ga. heavy duty flat cars.

HOISTING ENGINES
Gas: 15, 20, 60, 100 & 120 HP.
Electric: 20, 52, 80, 100 & 150 HP.
Steam: 6¼x8, 7x10, 8¼x10, 10x12, 12x14

DIESEL UNITS
75, 90, 100, 240 HP F. M. Engines.
110 HP Ingersoll Rand Engine.
175 KVA Worthington 3/60/2300.
275 KVA Fairbanks 3/60/2300.

BALL, ROD AND TUBE MILLS
6x9 Pebble Mill & 5x5 Batch Mill.
5'x22" HARDINGE CON. Dry Ball Mill.
6'x22" HARDINGE CONICAL Pebble Mill.
8'22" HARDINGE CONICAL Ball or Pebble Mill.
4x8, 6x6 & 10x9 Straight Ball Mills.
4x16, 5x18 & 5x22 Tube Mills & 6'x22'.
3½x8 & 5x7 Air Swept Tube Mills.
2x4½, 6x12 & 5x12 ROD MILLS.

PULVERIZERS
JEFFERY 24x20 & No. 1 Sturtevant Ring Roll.
RAYMOND Auto. Pulverizer No. 0000, 0 & 2.
RAYMOND Imp Mills No. 4, 32 & 55.
GRUENDLER XXB Mill & Jay Bee No. 3 & 4
RAYMOND 4 & 5 ROLL MILLS & 5 ft.Chaser M.

STEEL STORAGE TANKS
10,000 Gal., 15,000 Gal. & 20,000 Gal. Cap.

MATERIAL BIN
116 Ton Blaw Knox 2 Compt.

400 BARREL CEMENT BIN
400 Barrel Butler Portable Steel Cement Bin with Fuller automatic batcher, push button control.

SEPARATORS AND COLLECTORS
8, 10 and 14 ft. Separators, Garvo & Bradley.

ROLL CRUSHERS
36x60 Fairmount & 36x20 Diamond.

JAW CRUSHERS
10x8, 12x7½, 14x7, 15x9, 15x10, 16x9,16x12,16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 26x12,30x15,30x13, 36x15, 36x20, 26x18, 36x14, 36x9,36x6,36x10,36x24, 42x9, 48x42, 48x36, 60x42, 84x66, 36x16, 9x36.

CONE & GYRATORY CRUSHERS
42 in. McCully Mammoth Gyratory.
5 No. 19, 25, 27 & 49 Kennedy.
18 in.,24 in.,30 in.,36 in.and 48 in.Symons Disc.
4—10 TZ Traylor 4 ft. Gyratory.
4—Nos. 5, 3 & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory, also 16 inch.
8 in. Traylor T. Gyratory.
17 Gates K—Nos. 3, 4, 5, 6, 7½, 8 & 9½.
10 Inch Austin Model 10S.
6, 10 & 13 Inch Superior McCullys.

SYNCHRONOUS MOTOR GENERATORS
100 K.W. RIDGWAY 3/60/2200-250-275 volt.
150 K.W. GEN. ELEC. 3/60/2200-250-275 v.
200 K.W.RIDGWAY 3/60/2200-250-275v.,900 rpm.

SLIP RING MOTORS
52 H. P. GEN ELEC. 3/60/440 v., 1200 rpm.
(2) 100 H.P.GEN.ELEC.3/60/440v.,900-1200 rpm.

CONVEYOR PARTS
BELT: 1000 Ft.60 In.,700 Ft.60 In., 600 Ft.36 In., 800 Ft.30 In.,1042 Ft.24 In.,317 Ft.20 In., 297 Ft.18 In., 500 Ft.16 In.,300 Ft.14 In.
IDLERS: 54 In.,42 In.,36 In.,30 In.,24 In.,20 In.,18 In.,16 In. & 14 In.
Head & Tail—Pulleys—Takeup for all sizes.
Steel Frames: 2,000 Ft.24 In.,30 In.& 36 In.Sections.

ROTARY DRYERS AND KILNS
36 In.x20 Ft., 3 Ft.x30 Ft., 4 Ft.x30 Ft., 54 In. x 30 Ft.,42 In.x34 Ft.,5 Ft.x30 Ft.,5 Ft.x16 Ft.,5 Ft.x60 Ft.,6 Ft.x60 Ft.,6 Ft.x20 Ft., 6 Ft.x70 Ft.,10x29,7½x100 & 8x110. Ft. Kilns.

STEEL DERRICKS
GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 30 Ton 100 Ft. Boom
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom,25 Ton 100 Ft.Boom,75 Ton 135 Ft.Boom

LOCOMOTIVES
GASOLINE: 3 Ton,5 Ton,8 Ton,12,14,and 30 Ton
STEAM: 9 Ton,20 Ton,40 Ton,60 Ton & 80 Ton
ELECTRIC: 2 Ton, 5 Ton, 3 Ton, 40 Ton.
DIESEL: 4, 8 & 15 Ton.

SCREENS
VIBRATING: 2x4, 2x8, 12x3, 3x5, 3x5, 4x5, 4x8, 4x10, 48x72 & 4x12, 1, 2 & 3 Deck.
HUMMER, ROTEX, NIAGARA & ROBINS.
REVOLVING: 3x13, 3x16, 3½x18, 3x24, 4x16,4x20, 4x22, 4x24, 5x30, 5x20, 6x20.

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TRANSMISSION—CONVEYOR—ELEVATOR

"V" BELTS

FOR

PUMPS—CRUSHERS—PULVERIZERS—ETC.

RUBBER HOSE

FOR

AIR—WATER—STEAM—ETC.

Partial Stock List

NEW AND HEAVY DUTY

Conveyor and Elevator Belting

Quantity	Width	Ply	Top Cover	Bottom Cover	Type
668 Ft.	36"	6	1/8"	1/16"	Conveyor
660 "	30"	6	1/8"	1/16"	"
245 "	26"	5	1/8"	1/16"	"
906 "	24"	5	1/8"	1/32"	"
298 "	24"	4	1/8"	1/16"	"
370 "	22"	8	1/16"	1/16"	Elevator
296 "	22"	8	Friction		"
1455 "	20"	5	1/8"	1/32"	Conveyor
403 "	20"	4	1/8"	1/16"	"
1738 "	18"	4	1/8"	1/32"	"
60 "	18"	8	1/4"	1/16"	Elevator
288 "	18"	6	1/8"	1/16"	"
712 "	18"	4	1/16"	1/16"	Conveyor
1096 "	16"	4	1/8"	1/32"	"
554 "	16"	4	1/16"	1/32"	"
738 "	14"	4	3/32"	1/32"	"
288 "	14"	4	1/8"	1/16"	"
110 "	12"	8	1/8"	1/16"	Elevator
226 "	10"	6	1/16"	1/16"	"

USED BELTING—Good Condition

440 Ft.	48"	8	1/8"	1/16"	
210 "	20"	7	Friction		Elevator

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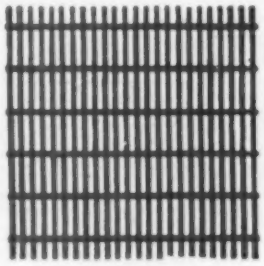

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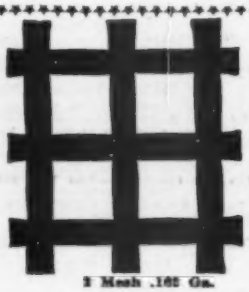

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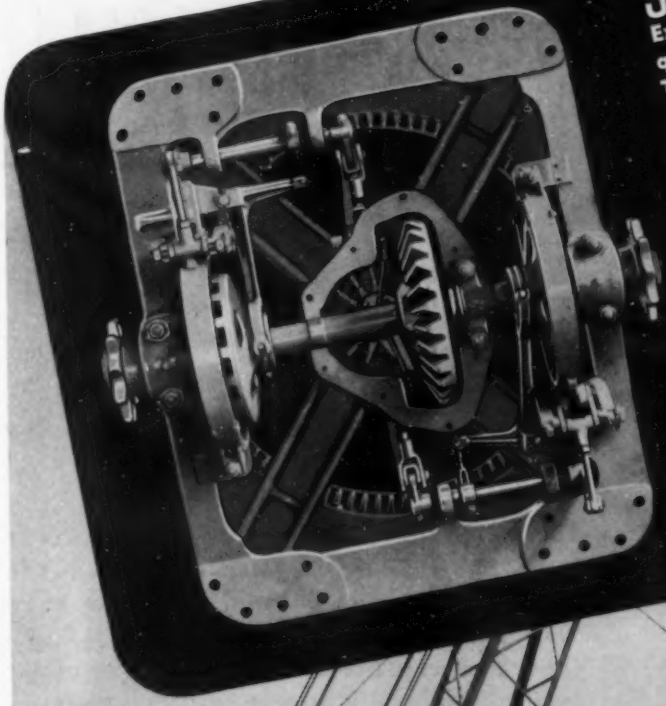

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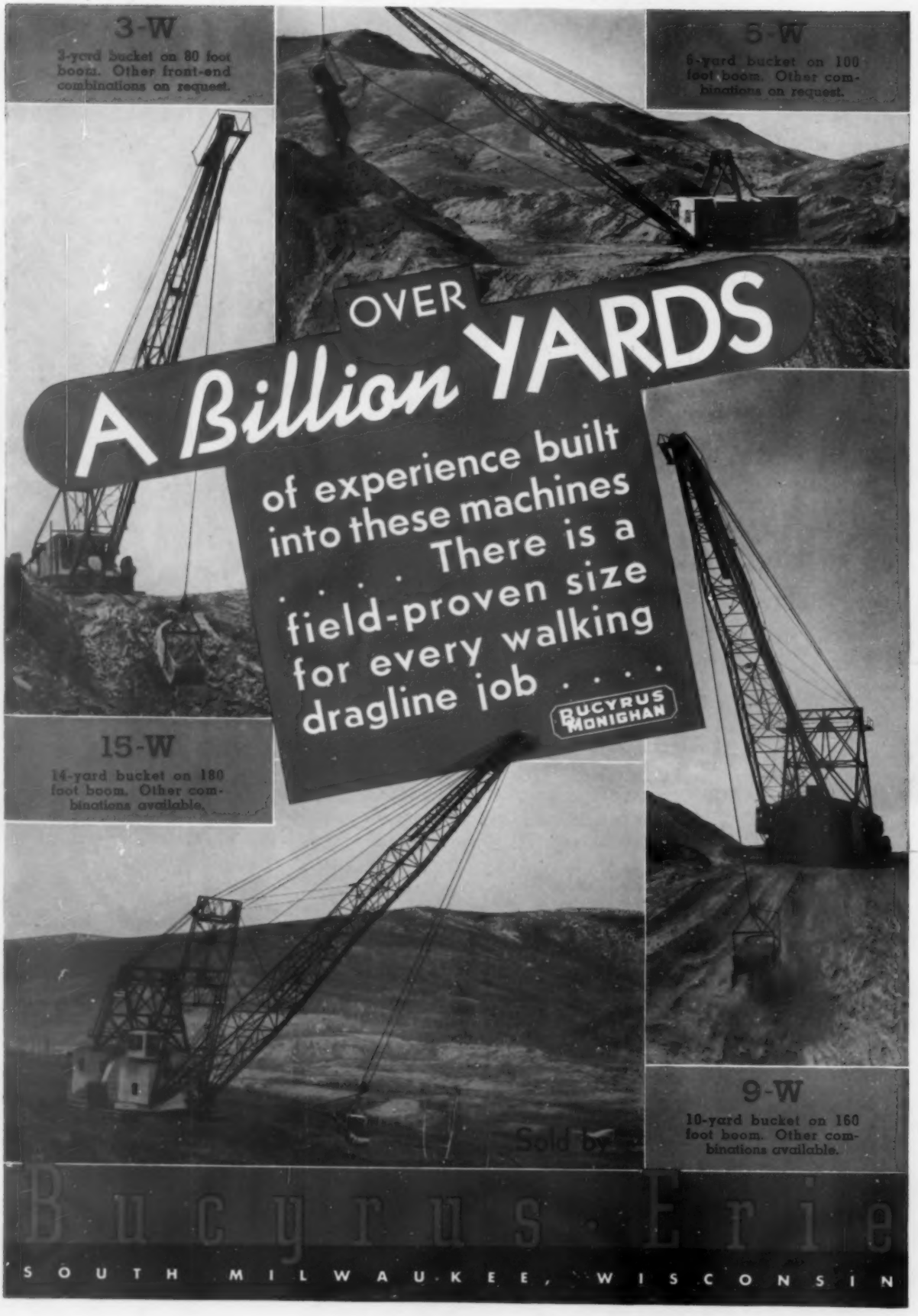
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